



**Department of  
Transportation**

**REHABILITATION OF SEVEN GRAND  
CENTRAL PARKWAY BRIDGES  
BETWEEN UNION TURNPIKE AND  
COMMONWEALTH BOULEVARD**

**PIN X051.59, Contract D900057**

**DB CONTRACT DOCUMENTS  
REQUEST FOR PROPOSALS**

**PART 8**

**SPECIAL SPECIFICATIONS**

**Final February 14, 2023**



**ITEM 800.1000NN15 – DESIGN BUILD – UTILITY RELATED WORK**

In the event of a discrepancy between the version of any Special Specification attached herein and the version available from the NYSDOT web site listed above, the version included in these Contract Documents shall apply.

**ITEM 555.02000001 - CONCRETE FOR STRUCTURES CLASS MP (MASS PLACEMENT)**

**DESCRIPTION:**

Furnish and place portland cement concrete with a minimum compressive strength of 3000 psi where specified on the Plans for mass concrete placements of structural elements. Follow §555, except as noted below.

**MATERIALS:**

§555-2, except as modified herein.

Using materials meeting the requirements of §501-2.02 and as indicated below, design a concrete mixture(s) based on the following criteria.

- Strength - 56 day minimum compressive strength of 3000 psi.
- Slump - 3 inches +/- 1 inch. A high range water reducing admixture may be used upon prior written approval from the Director, Materials Bureau. If adding a high range water reducing admixture, slump will be limited to 3 inches maximum before the addition. After the addition, slump will be limited to 8 inches maximum.
- Entrained Air - 5 to 8%.
- Water/Total Cementitious Material Ratio - 0.40 maximum.
- Class F Fly Ash - 20% to 50% by weight of cementitious materials.
- Cement, Type II only.

Perform mix development testing in accordance with ASTM C143, C231, C192 and C39 to assure all performance criteria can be achieved during production and placement.

An equal mix design may be submitted for evaluation to the Director, Material Bureau for approval.

At least one month prior to the start of any concrete placement, provide a copy of the proposed mixture design(s) and trial batch test results to the Director, Materials Bureau, submitted through the Engineer, for evaluation. Submit sufficient data to permit the Director to offer an informed evaluation. Include at least the following:

- Concrete mix proportions.
- Material sources. Also include fineness modulus and specific gravity for all aggregates.
- Air content of plastic concrete.
- Slump of plastic concrete.
- Compressive strength at 7, 14, 28, and 56 days and at any other age tested or deemed necessary.

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- Temperature/time relation (Interior of concrete with autogenous curing boxes) for 7 days measuring at hourly intervals.

Do not interpret having a valid mixture design as approval of the mixture. Resubmit any proposed mixture design change to the Director, Materials Bureau, for evaluation. Multiple mixture designs may be used to address performance and placement issues as deemed necessary by the Contractor. Submit each mixture for evaluation, as indicated above, prior to use.

**CONSTRUCTION DETAILS:**

Follow §555-3, except as modified herein:

Replace §555-3.01 - Concrete Manufacturing and Transporting with:

- §501-2.03 - Concrete Batching Facility Requirements,
- §501-2.04 - Concrete Mixer and Delivery Unit Requirements,
- §501-3.02 - Handling, Measuring, and Batching Materials, and
- §501-3.03 - Concrete Mixing, Transporting, and Discharging, except that the maximum concrete temperature at the point of discharge shall be as specified in the Thermal Control Plan.

The Contractor shall prepare a Thermal Control Plan prior to placement of the mass concrete.

**Thermal Control Plan:**

The Thermal Control Plan shall at a minimum include a Heat Dissipation Study (Reference ACI 207 or thermal modeling software) as well as to describe the measures and procedures the Contractor intends to use to satisfy the following Temperature Control Requirements for each mass concrete element:

- i. The Maximum Temperature Differential shall be limited to 35 degrees F. The temperature differential between the interior and exterior portions of the designated mass concrete elements during curing will be maintained to be less than or equal to this Maximum Temperature Differential, and
- ii. The Maximum Allowable Plastic Concrete Temperature shall be limited to 160 degrees F.

A change to the Temperature Control Requirements specified above can be addressed in the Thermal Control Plan through Heat Dissipation Studies to demonstration that deleterious effects to the concrete can be avoided through adherence to the Thermal Control Plan. Such a change requires approval by the D.C.E.S.

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As a minimum, the Thermal Control Plan shall include the following:

- A. Concrete mix design. If the mix will be cooled, the Contractor shall define the methodology and necessary equipment to achieve these mix temperatures.
- B. Duration and method of curing.
- C. Methods of controlling temperature differentials, inclusive of active coolant systems not previously defined within the Engineering Drawings.
- D. An analysis of the anticipated thermal developments in the mass concrete elements for all expected project temperature ranges using the proposed mix design, casting procedures, and materials. It shall show complete details and determine the maximum temperature differentials within the concrete mass.
- E. Temperature sensor types and locations including installation details.
- F. Temperature Monitoring System including system description, operating plan, recording and reporting plan, and remedial action plan.
- G. Field measures and documentation procedures to ensure conformance with the maximum concrete temperature and temperature differential requirements.
- H. Field methods of applying immediate corrective action should the temperature differential approach the Maximum Temperature Differential and Maximum Allowable Concrete Temperature.

The Contractor shall submit the Thermal Control Plan to the Engineer for approval a minimum of thirty working days prior to concrete placement. Mass concrete placement shall not begin until the D.C.E.S. has approved the Thermal Control Plan.

Acceptance/Testing of concrete shall follow §555-3.04 C, meeting the specified requirements of this specification and the Thermal Control Plan.

Modify §555-3.06 - Concrete Joints: Structural elements may be constructed in stages using construction joints if permission is granted by the Deputy Chief Engineer for Structures Design and Construction.

Modify §555-3.10 - Loading Limitations: After the minimum curing period, concrete may receive construction loads after reaching a compressive strength of 2500 psi. Testing will be in

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accordance with Note 3 of Table 555-4.

All concrete for this item shall achieve 3000 psi prior to opening the structure to traffic. Compressive strengths shall be determined from cylinders stored and cured in the same manner as the concrete it represents. The average compressive strength of each cylinder set shall be greater than the desired compressive strength, with no individual cylinder less than 90% of the desired compressive strength.

**Temperature Monitoring System:**

The temperature monitoring and recording system for mass concrete shall consist of temperature sensors connected to a data acquisition system capable of printing, storing, and downloading data to a computer. Temperature sensors shall be located such that the maximum temperature difference within a mass concrete element can be monitored. As a minimum, concrete temperatures shall be monitored from the center of the concrete mass, the base of the mass, the surface of the mass, and the center of an exterior outer face that is the shortest distance from the center of the concrete mass.

Temperature readings shall be automatically recorded on an hourly basis or as required by the Engineer. A redundant set of sensors shall be installed near the primary set. Provision shall be made for recording the redundant set, but records of the redundant sensors need not be made if the primary set is operational.

Methods of concrete consolidation shall prevent damage to the temperature monitoring and recording system. Wiring from temperature sensors cast into the concrete shall be protected to prevent movement. Wire runs shall be kept as short as possible. The ends of the temperature sensors shall not come into contact with either a support or concrete form, or reinforcing steel.

When any equipment used in the temperature control and monitoring and recording system fails during the mass concrete construction operation, the Contractor shall take immediate remedial measures to correct the situation as specified in the Thermal Control Plan.

Temperature reading will begin when mass concrete placement is complete. Temperature readings will continue until the maximum temperature differential (not maximum temperature) is reached and a decreasing temperature differential is confirmed as defined in the Thermal Control Plan. Furnish a copy of all temperature readings daily.

If monitoring indicates that the temperature differential is approaching the maximum temperature differential of 35 degrees F, the Contractor shall take immediate corrective action as defined in the Thermal Control Plan to retard further increase of the temperature differential. The Contractor will make the necessary revisions to the approved Thermal Control Plan to satisfy the

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temperature control requirements on future placements. Revisions to the plans must be approved by the Engineer prior to implementation.

§555-3.13 - Damaged or defective concrete, applies with the following additions:

If mass concrete temperature differentials are exceeded, provide all analyses and test results deemed necessary by the D.C.E.S. for determining the structural integrity and durability of the mass concrete element, to the satisfaction of the D.C.E.S.. The Department will make no compensation, either monetary or time, for the analyses, tests or any impacts upon the project.

Any cracks in the structural element greater than 0.016 inches resulting from the contractor's inability to properly maintain concrete temperature differentials, shall be repaired using epoxy injection at no additional cost to the Department. The effectiveness of repairs shall be demonstrated by the contractor using evaluation methods acceptable to the Department. The Engineer-In-Charge will be responsible for accepting or rejecting the repairs after the field evaluation.

**METHOD OF MEASUREMENT:**

Cubic yards as per §555-4.

**BASIS OF PAYMENT:**

§555-5, including the cost of the mix design and Thermal Control Plan in the unit bid price per cubic yard



**ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)**

**ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)**

**DESCRIPTION:** Install injection ports, seal the crack opening, inject the crack with epoxy (full depth for restoration work, or as deep as conditions allow for prevention work), and restore the sealed surface to a flush condition in areas visible to the public. Perform the work at locations indicated on the contract plans or where directed by the Engineer.

PREVENTION - use in contaminated, cracked concrete areas to prevent movement and protect reinforcing.

RESTORATION - use in uncontaminated cracked concrete areas to restore structural integrity. Take verification cores for payment. Have an experienced epoxy manufacturer representative present until the work is acceptable to the Engineer.

**MATERIAL REQUIREMENTS:**

1. Crack Sealant - epoxy paste that completely cures in 4 hours or less and retains the injected epoxy. Any other type of crack sealant is subject to a project demonstration and approval by the Engineer.
2. Low Viscosity Injection Epoxy - Manufacturer certified to meet ASTM C881, Type I or IV, Grade 1, Class B or C (as temperature conditions require.)
3. Vertical & Overhead Patching Material (Approved List) - (for ITEM 555.80020001) §701-08

**INJECTION EQUIPMENT:** Use equipment in good working order, as approved by the Engineer, with the following features:

- Separate feed lines to the mixing chamber
- Automatic mixing and metering pump
- Ability to thoroughly mix the epoxy components in the mixing chamber
- Operator control of the epoxy flow from the mixing chamber
- Clean, legible, accurate pressure gauges easily viewable by the operator
- Ability to provide an uninterrupted pressure head to continually force epoxy into the cracks
- Injection pressure from 0 to at least 200 PSI
- Capable of metering each epoxy component to within 3.0% of the epoxy manufacturer's mix ratio

Un-reacted epoxy components may be stored overnight in separate reservoirs and feed lines.

Before starting the work, demonstrate to the Engineer the ability of the equipment to meter and mix epoxy components to the required mix ratio. Ratio accuracy may be determined by simultaneously metering each component into separate, clean, accurately graduated, volumetric containers, or another procedure approved by the Engineer. Also, activate the automatic mixing and metering pump, mix a small amount of injection epoxy, and waste it into a disposable container. The Engineer will observe this trial operation and be satisfied the equipment is working properly, and the epoxy is mixed with no streaks.

**CONSTRUCTION DETAILS:**

**ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)**

**ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)**

1. Crack and Surface Preparation. Remove all debris or contaminants accessible within the cracks by using hand tools, water blasting or oil-free high pressure air blasting, vacuuming, or other methods suitable to the Engineer. Epoxy resin will not penetrate: compacted, water or oil soaked debris. Allow free moisture within the crack to be absorbed before injecting epoxy. Remove all materials, including moisture, from the surface adjacent to the crack which might interfere with bonding of the crack sealant.
2. Injection Port Installation. Attach injection ports to the prepared surface by placing them onto (surface adapters) or into the cracks (socket ports) and affixing with crack sealant. Larger cracks may be ported by inserting an anchored tube into the crack.

Use positive connection port designs to connect injection equipment to the ports. Other injection port designs and attachment methods, where worker fatigue would not be a problem, require approval by the Engineer.

Use the following general guidelines for spacing injection ports when cracks are uniform in width through the structure. For cracks that get tighter with depth, double this spacing. Intermediate ports may be placed for observation. To permit maximum flow into the void, position ports on the wider crack sections and at intersections, rather than at an exact spacing.

If these guidelines cannot be followed, use port locations approved by the Engineer. Port spacing may be modified by the Engineer as experience is gained, or when cores are taken to determine penetration.

**FOR CRACKS COMPLETELY THROUGH A MEMBER**

- A. Cracks accessible from one side - space the ports not less than the thickness of the member.
- B. Cracks accessible from both sides - space the ports not less than twice the thickness of the member and stagger them relative to the ports on the opposite side. Make the stagger between ports (on opposite sides of the member) at least the thickness of the member.

Place the endmost ports at the ends of the crack so as to insure complete filling of the crack.

**FOR MULTIPLE CRACKS ALL OVER A MEMBER.**

Space the ports as far apart as practical, but not less than 8" from one another. An 8" spacing presumes a 4" penetration in each direction, if the adjacent ports are not plugged when epoxy reaches them. For fine cracks that taper to an end, place the endmost ports about 4" from the end.

3. Crack Seal. After port installation, seal the crack opening with crack sealant, being careful not to plug the injection ports. Allow the crack sealant to cure completely before injecting epoxy.

Apply crack sealant only when surface and ambient temperatures are above 50° F.

**ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)**

**ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)**

4. Port Flushing. Prior to any epoxy injection, flush critical ports with oil-free compressed air to verify that air exits from all the installed ports, dry the cracks, and check for leaks.
5. Epoxy Injection. Perform epoxy injection only when the surface and ambient temperatures are above 45° F and are not expected to fall below 45° F during the next 24 hours.

UNIFORM WIDTH CRACKS - start toward the middle of a horizontal crack and work outward, or the lowest point of a sloping or vertical crack and work upward.

VARIABLE WIDTH CRACKS - start at the widest points of all types of cracks and work outward. Secure the feed line to the first port. Initiate and continue flow until epoxy exits from the adjacent port. (Plug observation ports and continue through the same port to achieve maximum penetration.) Temporarily stop the injection process, remove the feed line, and seal the port. Attach the feed line to the adjacent port and repeat this procedure along the crack until the last port is sealed.

Generally, use higher pressures when injecting narrow deep cracks, medium to low for wider cracks, and lowest pressures when injecting a delaminated area or an area susceptible to lifting. Low pressure applied for a longer duration is often more effective than high pressure applied for a shorter duration.

Replenish the epoxy supply in the mixing equipment before it is exhausted. Thoroughly stir each epoxy component both before and after adding it to its respective component in the mixing equipment. Exercise care to assure a continuous injection operation.

Allow the epoxy to fully cure prior to performing subsequent work in the repaired area.

In the event of leakage from a crack, stop the injection process until the leak is sealed. When any work stoppage exceeds 15 minutes, clean the mixing chamber and flush the line that carries mixed epoxy. Flush with a suitable solvent, followed by air.

6. For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), take cores ranging in diameter from 1 to 4", as approved by the Engineer, to verify full penetration by epoxy and its cure. Take a representative core from each structural element, or one from every 100 feet of crack repaired, whichever is greater, at locations approved by the Engineer. The Engineer will retain the cores and determine if they are acceptable for payment. Patch the holes with Vertical & Overhead Patching Material.

More than one core may be necessary to obtain an acceptable sample from cracks that diverge below the surface. (To avoid cutting reinforcing, the core drill may be angled to intercept a crack behind the reinforcing.)

7. Clean Up. In all areas visible to the public, as determined by the Engineer, remove spillage, the ports and crack sealant until flush with the adjacent surface. Remove stains and repair any damage to the satisfaction of the Engineer at no additional cost.

**ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)**  
**ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)**

**METHOD OF MEASUREMENT:** The Engineer will measure the work as the number of linear feet of crack sealed or repaired, as specified.

**BASIS OF PAYMENT:** Include the cost of all labor, materials, and equipment necessary to complete the work in the unit price bid per linear foot. For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), also include the cost of coring and repairing the core holes.

For ITEM 555.80010001 CRACK SEALING BY EPOXY INJECTION (PREVENTION), the Engineer will authorize payment after the measured length of crack has been sealed and the surface cleaned.

For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), the Engineer will authorize payment after the measured length of crack has been repaired as verified by cores, the core holes patched and the surface cleaned.

**ITEM 557.01040018 - LIGHTWEIGHT, HIGH - PERFORMANCE SUPERSTRUCTURE  
SLAB WITH INTEGRAL WEARING SURFACE - BOTTOM FORMWORK  
REQUIRED**

**ITEM 557.05040018 - LIGHTWEIGHT, HIGH - PERFORMANCE SUPERSTRUCTURE  
SLAB WITH INTEGRAL WEARING SURFACE - BOTTOM FORMWORK  
NOT REQUIRED**

**ITEM 557.07040018 - LIGHTWEIGHT, HIGH - PERFORMANCE SUPERSTRUCTURE  
SLAB WITH SEPARATE WEARING SURFACE - BOTTOM FORMWORK  
REQUIRED**

**ITEM 557.09040018 - LIGHTWEIGHT, HIGH - PERFORMANCE SUPERSTRUCTURE SLAB WITH  
SEPARATE WEARING SURFACE - BOTTOM FORMWORK NOT REQUIRED**

**DESCRIPTION.** Furnish and place lightweight, high performance (Class HP) concrete to construct superstructure slabs as shown in the contract documents.

**MATERIALS.** Use materials meeting §557-2. Perform additional work as follows:

**A. Design.** Design a lightweight, high-performance concrete mixture, proportioned according to the American Concrete Institute Manual of Concrete Practice, ACI 211.2, Standard Practice for Selecting Proportions for Structural Lightweight Concrete.

1. Produce a homogeneous mixture of cement, pozzolan (Fly Ash or GGBFS), microsilica, fine aggregate, lightweight coarse aggregate, air entraining agent, normal range set-retarding, water-reducing admixture, and water, as designed.
2. Use Type I, I/II, II (§701-01) or Type SF (§701-03) cement. Use a minimum cementitious content of 675 lb/yd<sup>3</sup>. Use 15-20% pozzolan (§711-10, Flyash, or §711-12 GGBFS), and 6-10% microsilica (§711-11).
3. Use lightweight coarse aggregate conforming to §703-10, with a gradation in the 3/4 inch to No. 4 size designation in ASTM C330, Table 1.
4. Determine the cement content for each trial batch by means of a yield test according to ASTM C138.
  - a. At least 10 working days prior to concrete placement, provide the Materials Engineer with a copy of the trial mix design with the following data:
    - Fine and coarse aggregate (saturated, surface dry condition) content in lb/yd<sup>3</sup>.
    - Cementitious content in lb/yd<sup>3</sup>.
    - Water content in lb/yd<sup>3</sup>.
    - Unit weight of freshly mixed concrete in accordance with ASTM C138.
    - Dry unit weight in accordance with ASTM C567.
    - 28-day compressive strengths.
    - Batch quantities of all materials as they will appear on the batch record.
  - b. The Materials Engineer, or their representative, will approve the batch quantities prior to use. Use these values to manufacture all lightweight concrete for this project, and periodically correct the batch weights to account for changes in the fine aggregate fineness modulus and aggregate moisture contents in accordance with Materials Method 9.1, or current Department directives.

**B. Stockpile Handling.** Construct lightweight coarse aggregate stockpile(s) at the production facility so as to maintain uniform moisture throughout the pile. Continuously and uniformly sprinkle the stockpile(s) with water using a sprinkler system approved by the Materials Engineer. Soak for a minimum of 48 hours, or until the stockpile has achieved a

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minimum internal moisture content of 15% by weight. If a steady rain of comparable intensity occurs, turn off the sprinkler system.

If the rain ceases prior to the end of the wetting period, restart the sprinkling system. At the end of the wetting period, or when a rainfall ceases beyond the end of the wetting period, allow stockpiles to drain for 12 to 15 hours immediately prior to use.

**C. Sampling of Materials.** The Materials Engineer's representative, will take a 1 liter sample of microsilica in accordance with Materials Method 9.1, or current Department directives, for each day's placement for testing. Sampling of other materials will be at the direction of the Regional Materials Engineer.

**D. Batching.** After the materials have been accepted for this work, determine the proportions for concrete and equivalent batch weights based on trials made with materials to be used in the work.

- If densified microsilica powder is used and added independently - weigh cumulatively in the following order: cement, fly ash (or GGBFS), then microsilica. Base the batching tolerance of  $\pm 0.5\%$  on the total weight of cementitious material, for each material draw weight.

- If densified microsilica powder is used as part of blended cement - weigh cumulatively in the following order: blended cement, then fly ash (or GGBFS). Base the batching tolerance of  $\pm 1\%$  on the total weight of cementitious material, for each material draw weight.

**E. Compressive Strength Determination.** Achieve an average 28-day compressive strength of 3600 psi, or greater, with no individual cylinder compressive strength less than 3000 psi.

**F. Density Determination.** Produce concrete with an average dry unit weight ranging from 110 to 115 lb/ft<sup>3</sup> when tested in accordance with ASTM C567.

**CONSTRUCTION DETAILS.** Apply the provisions of §557-3 and the following modifications:

**A. Concrete Manufacturing and Transporting.** Add the following to §557-3.01:

1. Use slump, unit weight and air tests as a control measure to maintain a suitable consistency. Perform slump, unit weight and air tests according to Materials Method 9.2. Determine air content by the volumetric method (roll-a-meter) as described in ASTM C173. Air content and slump placement limits are:

	Minimum	Desired	Maximum
<b>Air Content (%)</b>	5.0	6.5	8.0
<b>Slump (inches)</b>	2 1/2	3-5	5

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2. If the lightweight coarse aggregate moisture content at the time of batching is less than saturated surface dry (SSD), introduce the coarse aggregate, along with approximately  $\frac{2}{3}$  of the total mixing water, into the mixer and mix for a minimum of 10 minutes, then continue batching the remaining ingredients. If the coarse aggregate is in an SSD condition, batch the coarse aggregate routinely with the fine aggregate, admixtures, cement, fly ash (or GGBFS), microsilica, and mixing water, then mix completely.

3. Have the lightweight aggregate manufacturer supply a service representative at the site for the first two days of concrete placement operations to assist in the control of lightweight concrete mixing and placement.

**B. Handling, Placing and Finishing.** Handle and place concrete according to §557-3.05, except that pumping is not permitted. When an integral wearing surface is required, finish the concrete according to 557- 3.07. If the concrete will be overlaid with a separate wearing surface, finish the surface according to 557-3.09.

**C. Testing.** Test the concrete according to Materials Method 9.2. The unit mass of the fresh concrete during placement should be compared to that which was submitted with trial mix design. Make adjustments to the concrete mix at the batching facility based on slump, unit weight and air tests. The Engineer will cast cylinders, in sets of 2 individual cylinders, at a frequency of 1 set for each 50 yd<sup>3</sup>, or fraction thereof actually placed. A minimum of 1 set will represent each day's concrete placement.

**D. Curing.** Cure the concrete according to §557-3.11, except that only continuous wetting is allowed. In cold weather, the provisions of §557-3.12 shall apply.

**E. Repairs.** Make any repairs as per the provisions of §557-3.16. Proposed repairs require Deputy Chief Engineer, Structures approval.

**F. Rejection of Concrete.** The Engineer will reject any concrete represented by a 28-day cylinder set with an average compressive strength less than 3600 psi, or an individual cylinder with a compressive strength less than 3000 psi.

**G. Loading Limitations.** The loading limitations of §557-3.14 apply, except that concrete cylinder sets designated for early loading must attain an average compression strength of 3600 psi, or greater, with no individual cylinder less than 3000 psi.

**METHOD OF MEASUREMENT.** Apply all of the provisions of §557-4.

**BASIS OF PAYMENT.** Apply all of the provisions of §557-5.

ITEM 557.6401XX03 - PRECAST CONCRETE DECK - TYPE XX FRICTION  
ITEM 557.6403XX03 - PRECAST CONCRETE APPROACH SLAB - TYPE XX FRICTION  
ITEM 557.11010003 - INTEGRAL PRECAST CONCRETE BARRIER

**DESCRIPTION.**

Furnish and place precast concrete deck, precast concrete approach slab and integral precast concrete barrier with ultra high performance concrete (UHPC) joints. The maturity method shall be used to estimate the in-place UHPC strength. The time required before removal of the forms and loading of the structure will be determined based on the estimated in-place UHPC strength. "Panels" refers to both the concrete deck and to the approach slab.

XX = Friction Type  
01 - Type 1 Friction  
02 - Type 2 Friction  
03 - Type 3 Friction  
09 - Type 9 Friction

## MATERIALS

**PRECAST CONCRETE PANELS:** Materials used in this work shall conform to the NYSDOT Prestressed Concrete Construction Manual (PCCM)-Current Edition and the following:

**STEEL EMBEDMENTS.** Steel embedments for the panel leveling devices and hold down devices shall be installed in the shop based upon the locations shown on the shop drawings.

Leveling Bolts                      ASTM F568M, Class 4.6

## CONCRETE

28 Day Compressive Strength	5000 psi	(Minimum)
Lifting Strength	3000 psi	(Minimum)
Epoxy Coated Bar Reinforcement	709-04	
Mechanical Connectors	709-10	
Water	§712-01	
Aggregates (Friction Type)	501-202.B	

## PRECAST CONCRETE APPROACH SLAB

The supplier must demonstrate a system to place the approach slab using a grout bed such that the approach slab is fully supported at the proper line and grade.

**INTEGRAL PRECAST CONCRETE BARRIER:** The requirements of the PCCM and the following shall apply.

Tolerances:

- |                                                                             |                   |
|-----------------------------------------------------------------------------|-------------------|
| 1) Bar Reinforcement Cover                                                  | -0, + ½ inch      |
| 2) Width of Unit at the top                                                 | -0, + ¼ inch      |
| 3) Width of Unit at the bottom                                              | -0, + ½ inch      |
| 4) Surface deviation from theoretical centerline                            | ½ inch in 20 feet |
| 5) Vertical Alignment (deviation from a line parallel to theoretical grade) | ½ inch in 20 feet |
| 6) Horizontal and Vertical Alignment (between adjacent units)               | 3/16 inch         |



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**ITEM 557.6403XX03 - PRECAST CONCRETE APPROACH SLAB - TYPE XX FRICTION**  
**ITEM 557.11010003 - INTEGRAL PRECAST CONCRETE BARRIER**

**JOINT MATERIAL UHPC:** The material shall be Ultra High Performance Concrete, all components supplied by one manufacturer. Materials commonly used in UHPC are:

- Fine aggregate
- Cementitious material
- Super plasticizer
- Accelerator
- Steel Fibers

UHPC material shall meet the following, 28 days unless otherwise noted:

Minimum Compressive Strength (ASTM C39)

High Heat-Treated*	$\geq 25$ ksi
Medium Heat-Treated 12 hours**	$\geq 12$ ksi
Not Heat-Treated 14 days***	$\geq 21$ ksi

Prism Flexural Tensile toughness (ASTM C1018; 12 in. span)	$I_{30} \geq 48$
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Long-Term Shrinkage (ASTM C157; initial reading after set)	$\leq 766$ microstrain
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Chloride Ion Penetrability (ASTM C1202)	$\leq 250$ coulombs
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Chloride Ion Penetrability (AASHTO T259; ½ in. depth)	$< 0.07$ oz/ft <sup>3</sup>
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Scaling Resistance (ASTM C672)	$y < 3$
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Abrasion Resistance (ASTM C944 2x weight; ground surface)	$< 0.025$ oz. lost
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Freeze-Thaw Resistance (ASTM C666A; 600 cycles)	RDM $> 96\%$
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Alkali-Silica Reaction (ASTM C1260; tested for 28 days)	Innocuous
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\* High Heat-Treated - According to manufacturer's recommendation, temperature not to exceed 250°F.

\*\* Medium Heat Treated temperatures not to exceed 120°F

\*\*\* Not Heat Treated temperature not to exceed 70°F

Results of all the tests above, conducted by an AASHTO accredited testing lab shall be submitted to the DCES along with the installation drawings. Provide to the DCES a list of bridge projects in which the proposed UHPC material has been used as joint fill between precast concrete elements (within or outside the USA). The DCES reserves the right to reject a proposed UHPC material which lacks a proven track record in precast concrete joint filling in bridge applications.

**Storage:** The contractor shall assure the proper storage of premix, fibers and additives as required by the supplier's specifications in order to protect materials against loss of physical and mechanical properties.

**Acceptance Testing:** Note: acceptance testing will be waived if the same material from the same supplier has already been tested according to this standard. The Contractor shall complete the testing of the UHPC a minimum of one month before placement of the joint. The testing sequence will include the submission of a plan for casting and testing procedures to the DCES for review and approval followed by casting and testing according to the approved plan.

Casting and testing must include the following:

A minimum of 12 cylinders 3in. x 6 in. shall be cast.

The temperature during curing shall be as per heat treatment temperature limits established in this specification. 2 cylinders shall be tested each testing interval. Testing intervals are at 10 hours, 12 hours, 14 hours, and 24 hours. The compressive strength shall be measured by ASTM C39. Only a concrete mix design that passes these tests may be used to form the joint.

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Pullout Test: Cast 6 additional cylinders 12 in. diameter and 7.5 in. deep. Each cylinder shall have one 32 in. long epoxy-coated reinforcing bar cast in the center of the circular face. The axis of the bar shall be perpendicular to the formed surface. 3 of the bars shall be #6 bars embedded 5 in. deep and 3 of the bars shall be #4 bars embedded 3 in. deep. These cylinders will be kept wet for four days then delivered to the Materials Bureau for testing according to Test Method No. NY 701-14 E. Contact the Materials Bureau prior to casting for specific instructions on preparing the test specimens. The test will be performed as soon as practical after the corresponding compressive strength samples reach 12 ksi. Acceptance criteria for pullout testing shall be when there is complete tensile failure of the reinforcing bar, prior to pullout from the concrete or failure of the concrete.

**EQUIPMENT FOR MATURITY TESTING:**

Use a Maturity Meter and thermocouples that can:

- \$ Provide a maturity value based on the Equivalent Age or Temperature Time Method as detailed in ASTM C 1074-11.
- \$ Continuously log and store maturity data.
- \$ Accurate to within +/- 1° F when the meter is calibrated as per the manufacturer=s instructions.
- \$ Take readings every half hour for the first 48 hours and every hour after that at a minimum.
- \$ Print data and/or download it into a spreadsheet.

**METHODOLOGY FOR MATURITY TESTING:**

The procedure for utilizing the maturity method to determine in-place UHPC strengths includes three steps: development of the strength-maturity relationship, monitoring the maturity of the placement, and regular validation of the strength maturity relationship. Any changes in the mix design, its components, or proportions will require that a new strength-maturity relationship be developed.

The strength-maturity relationship shall be developed one month prior to construction. Continue data collection for the strength-maturity relationship after acceptance of the maturity value until the strength reaches 21 ksi.

A procedure to develop the strength-maturity relationship shall be submitted to the DCES for review and approval along with the shop drawings. The submitted procedure shall include all necessary information for the development of the strength maturity relationship. All necessary testing included in the procedure shall be conducted by an AAHSTO accredited testing lab.

**CONSTRUCTION**

**DRAWINGS FOR PRECAST CONCRETE PANELS AND BARRIER**

Shop drawings and installation drawings shall be prepared and submitted as per the requirements of the Prestressed Concrete Construction Manual, (PCCM), and the following:

The submitted drawings shall include details of lifting and handling of panels in the production facility and their storage, transportation, handling and storage at the construction site. Lifting holes will not be

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permitted. The proposed handling and lifting shall be such that the maximum tensile stress in concrete due to handling and erection loads shall not exceed  $0.15(f'_{ci})^{1/2}$ , where  $f'_{ci}$  is the concrete compressive strength at the time being considered. Calculations showing actual concrete stresses based upon the proposed support locations and expected dynamic loading of the panels during handling, storage and transportation of the panels shall be prepared by a Professional Engineer and shall be submitted along with the drawings. These drawings and calculations shall be stamped and signed by a Professional Engineer.

Integral precast concrete barrier shall be cast integrally with the precast concrete deck prior to shipping. Proposed procedures for the casting, handling, and shipping shall be included in the drawings for the precast concrete panels.

The proposed method of mixing, placing, and curing the UHPC joints shall be shown on the installation drawings. The Contractor shall perform qualification testing using maturity method and the results shall be shown on the installation drawing to demonstrate that the proposed method of curing will achieve the required strength at the required time.

**FABRICATION OF PRECAST CONCRETE PANELS**

Fabrication shall meet the requirements of the PCCM and the following:

**Fabrication Tolerances**

1. Width (transverse direction of the bridge): +1/8, -1/8 in.
2. Length (longitudinal direction of the bridge): +1/8, -1/8 in.
3. Depth (overall): +1/8, -0 in.
4. Bulkhead alignment (deviation from square or designated skew)
  - Vertical 1/4 in.
  - Horizontal 1/4 in.
5. Horizontal alignment (deviation from straight line parallel to centerline of unit):
  - 1/4 in. for 40 ft length
  - 3/8 in. for 40 ft to 60 ft length
  - 1/2 in. for greater than 60 ft length

Welding of steel shall comply with the requirements of the New York State Steel Construction Manual.

**Placing Concrete, Curing and Finishing**

All requirements stipulated in PCCM shall apply except for the following:

After curing, all form release material and all other forming material adhering to the shear keyway and block out concrete shall be removed. Shear key faces shall be roughened and blast cleaned.

**Shipping and Handling of Precast Panels and Precast Concrete Barrier.** Shall be as per approved drawings.

**Loading of Panels.** Equipment weighing more than 2500 pounds shall not be permitted on the precast units between the initial set of the UHPC and the time the UHPC has reached a minimum strength of 10 ksi.

**Mixing and Placing UHPC Joints and Haunches.** Specifications in the PCCM and the following:

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Thoroughly and continuously wet the concrete contact area for 24 hours prior the placing of UHPC, keep wet and remove all surface water just prior to UHPC placement.

#### **INSTALLATION REQUIREMENTS FOR DECK SLABS**

Installation shall meet the requirements of the PCCM and the following:

1. Prior to installing panels, the supporting steel surfaces in contact with the panels or field placed concrete shall be cleaned, including removal of free water, to the satisfaction of the engineer.
2. Installation tolerances shall be as per the approved installation drawings. It is the responsibility of the contractor to develop appropriate controls during the fabrication and installation of the panels so that proper cross slopes and grades are achieved after the diamond grinding operation. Installation drawing shall show the details of the proposed controls.

#### **INSTALLATION REQUIREMENTS FOR APPROACH SLABS**

Bed and level slabs in accordance with the system designer's instructions such that the vertical differential across any joint is  $\frac{1}{4}$  in. or less. Slabs shall be placed on grade and have grout pumped underneath to ensure that they are completely supported.

#### **INSTALLATION REQUIREMENTS FOR UHPC**

The contractor shall arrange for a representative of the UHPC supplier to be on site during the placement of the joints until the Contractor's own staff has become well-trained in the use of the material. The representative shall be knowledgeable in the supply, mixing, delivery, placement, and curing of the UHPC material.

#### **GROUTING OF HAUNCHES**

Grouting shall meet the requirements of the PCCM, except that the requirement related to post-tensioning shall not apply. Details of grouting ports, vents, method of pumping the grout, equipment with necessary back up shall be shown on the installation drawing. Required QC for the grouting also shall be listed on the drawings.

**PRE-INSTALLATION MEETING:** Convene a preplacement meeting 7 to 14 calendar days before the planned start of slab installation. The contractor shall arrange for an on site meeting with representatives from the UHPC and the precast system suppliers. The contractor's staff and the NYSDOT Engineer and Inspectors shall attend the site meeting. The objective of the meeting will be to clearly outline the procedures for placing and leveling the precast concrete panels and for mixing, transporting, finishing and curing of the UHPC material.

#### **Form Work, Batching and Curing**

The design and fabrication of forms shall follow approved installation drawings and shall follow the recommendations of the manufacturer. All the forms for UHPC shall be constructed from plywood or approved equal. The forms shall be coated to prevent absorption of water using a form release agent from the Department's Approved List of Materials.

The contractor shall follow the batching sequence as specified by the supplier and approved by the DCES. The surface of the UHPC field joints shall be filled as shown on the approved drawings.

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The UHPC in the form shall be cured according to Manufacturer's recommendations to attain the required strength shown on the contract documents.

**Quality Control**

The contractor shall measure the slump flow on each batch of UHPC. The slump flow will be conducted using a mini-slump cone. The flow for each batch shall be between 7 in. and 10 in. The slump flow for each batch shall be recorded in the QA/QC log. A copy of the log shall be given to the Engineer.

**Estimation of In-Place Strength:**

1. Two thermocouples per each UHPC joints, one at each end, shall be installed. The locations of these installations shall be shown on the installation drawings. These locations shall be revised if directed by the DCES. The thermocouple wiring may be connected to reinforcing steel, but probe endings may not be in direct contact with the steel. Consider structural or exposure conditions when placing thermocouples.
2. Listed actions are allowed when the maturity value of all the thermocouples reaches the corresponding strength values listed below.

Action	Strength Requirement
Removal of top forms	10 ksi
Open Bridge deck to Traffic	12 ksi

3. Record and save the maturity data from the meter until the strength reaches 21 ksi. Disconnect the meter and clip all wires flush with the concrete surface.

A continuous read thermocouple or thermistor with a data logger can be used to estimate in place strength. The methodology outlined in ASTM C 1074-11 will be used. The maturity function used to estimate strength will be calculated with the same formula that is used by the maturity meter that established the initial strength maturity relationship. Copies of the calculations will be provided to the engineer.

**Validation of the Strength-Maturity Relationship:**

For each day of placement, perform validation tests by casting 7 cylinders. Equip one of the cylinders with a thermocouple. Test the cylinders as close as possible to the maturity value corresponding to 21 ksi. Record the maturity value immediately prior to testing. All testing shall be conducted by an AASHTO accredited testing lab. Report the results to the DCES.

If the average value of compressive strength of each pair of cylinders is within 10% of the estimated value, the strength-maturity relationship will be validated. If the average cylinder value is more than 10% below the estimated value, the strength maturity relationship will need to be re-established. If the first four cylinders produce acceptable results, the remainder need not be tested.

The Department may perform additional testing for research purposes. Casting and testing in addition to that required in this spec will be performed by NYSDOT personnel.

In case of loss of required data, or non verification of the strength-maturity relationship, use the cylinders cast above, one pair at a time, to verify the strength.

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**METHOD OF MEASUREMENT.** For precast concrete bridge decks and precast concrete approach slabs apply all the provisions of §557-4. For precast concrete bridge barrier apply all the provisions of §569-4.

**BASIS OF PAYMENT.** For precast concrete bridge decks and precast concrete approach slabs apply all the provisions of §557-5. For precast concrete bridge barrier apply all the provisions of §569-5.

**ITEM 557.2500NN16 - CRACK SEALING USING HIGH MOLECULAR WEIGHT  
METHACRYLATE - LINEAR CRACKS**

**DESCRIPTION**

This work shall consist of furnishing and installing Crack Sealing Using High Molecular Weight Methacrylate in accordance with the contract documents and as directed by the Engineer.

**MATERIALS**

The high molecular weight methacrylate (HMWM) resin shall be low viscosity and non-fuming. Acceptance is based on the manufacturer certifying that it conforms to the following, and the contractor forwarding the certification to the DCES:

Viscosity	Less than 25 cps when measured according to ASTM D2849
Density	Greater than 8.4 lb/gal. @ 77° F.
Flash Point	Greater than 200° F.
Vapor Pressure	Less than 1.0 mm Hg @ 77° F. (ASTM D 323)
TG (DSC)	Greater than 136° F (ASTM D3418)
Gel Time	Greater than 40 minutes for 3.5 ounces
Percent Solids	Greater than 90 % by weight
Bond Strength	Greater than 1522.3 psi (ASTM C882)

Sand The sand shall be commercial quality dry blast sand. 95% of the sand shall pass the #8 sieve, and 95% shall be retained on the #30 sieve.

The container shall include the following information: The name of the manufacturer, the brand name of the product, the date of manufacture.

**CONSTRUCTION DETAILS**

Abrasive blast clean the area to be treated, removing all contaminants from the surface. Clean all surfaces and cracks using compressed air which is free of oil and moisture.

Do not apply sealers if rain is expected within 12 hours of completion. Apply sealers to clean, dry surfaces when the surface temperature is at least 50° F, and if near 50° F, rising. The sealer shall be mixed and applied according to the manufacturer's instructions and no more than 5 gallons at a time. Pour sealer into the cracks.

After the resin has been applied, at least 20 minutes shall elapse before applying the sand. The sand shall be broadcast at a rate of approximately two pounds per square yard, completely covering the sealer.

The sealer must be tack-free before traffic is permitted to resume.

**METHOD OF MEASUREMENT**

This work will be measured as the number of feet of Crack Sealing Using High Molecular Weight Methacrylate satisfactorily furnished and installed.

**BASIS OF PAYMENT**

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

**ITEM 557.2600NN16 - CRACK SEALING USING HIGH MOLECULAR WEIGHT  
METHACRYLATE - FLOODING**

**DESCRIPTION**

This work shall consist of furnishing and installing Crack Sealing Using High Molecular Weight Methacrylate in accordance with the contract documents and as directed by the Engineer.

**MATERIALS**

The high molecular weight methacrylate (HMWM) resin shall be low viscosity and non-fuming. Acceptance is based on the manufacturer certifying that it conforms to the following, and the contractor forwarding the certification to the DCES:

Viscosity	Less than 25 cps when measured according to ASTM D2849
Density	Greater than 8.4 lb/gal. @ 77° F.
Flash Point	Greater than 200° F.
Vapor Pressure	Less than 1.0 mm Hg @ 77° F. (ASTM D 323)
TG (DSC)	Greater than 136° F (ASTM D3418)
Gel Time	Greater than 40 minutes for a 100 gram mass
Percent Solids	Greater than 90 % by weight
Bond Strength	Greater than 1522.3 psi (ASTM C882)

Sand The sand shall be commercial quality dry blast sand. 95% of the sand shall pass the #8 sieve, and 95% shall be retained on the #30 sieve.

The container shall include the following information: The name of the manufacturer, the brand name of the product, the date of manufacture.

**CONSTRUCTION DETAILS**

Abrasive blast clean the area to be treated, removing all contaminants from the surface. Clean all surfaces and cracks using compressed air which is free of oil and moisture.

Do not apply sealers if rain is expected within 12 hours of completion. Apply sealers to clean, dry surfaces when the surface temperature is at least 50° F, and if near 50° F, rising. The sealer shall be mixed and applied according to the manufacturer's instructions and no more than 5 gal. at a time. Sweep, pour, squeegee, or spray the area to receive the sealers, allowing the sealers to flow into the cracks. If the manufacturer does not recommend an application rate, use 8.5 to 11.8 square yards per gallon, as needed.

After the resin has been applied, at least 20 minutes shall elapse before applying the sand. The sand shall be broadcast at a rate of approximately two pounds per square yard, completely covering the sealer.

The sealer must be tack-free before traffic is permitted to resume.

**METHOD OF MEASUREMENT**

This work will be measured as the number of square yards of Crack Sealing Using High Molecular Weight Methacrylate satisfactorily furnished and installed.

**BASIS OF PAYMENT**

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.



## **ITEM 557.6601NN16 - ULTRA-HIGH PERFORMANCE CONCRETE (UHPC)**

### **DESCRIPTION**

This work shall consist of furnishing and installing ULTRA-HIGH PERFORMANCE CONCRETE (UHPC) in accordance with the contract documents and as directed by the Engineer. Strength determination is permitted to be made through compressive testing or maturity testing. Ultra-High Performance Concrete (UHPC) includes, but is not limited to precast deck panel joints, closure pours, link slabs, and joint headers. It does not include bridge deck overlays.

### **MATERIALS**

UHPC shall be accepted based on the Manufacturer and product designation appearing on the Approved List under Bridge Joint Systems. Other materials can be accepted if they meet the requirements below:

**UHPC Acceptance Criteria:** UHPC which is not on the Approved List can be accepted by meeting the material requirements below. Contact DCES for testing and acceptance procedures. The preparation for the testing and the acquisition of results for the testing may take several months. No extension of time will be granted for completion of testing. All components of Ultra-High Performance Concrete shall be supplied by one Manufacturer. Materials commonly used in UHPC are:

Fine aggregate  
Cementitious material  
Super plasticizer  
Accelerator  
Steel Fibers 2% minimum by volume

### **UHPC Material Properties**

UHPC material shall meet the following, at 28 days unless otherwise noted:

Minimum Compressive Strength (ASTM C39)	18 ksi
Minimum Compressive Strength (four days)	12 ksi
Flexural Tension Stress, (ASTM C1609, first crack, minimum	1.5 ksi
Flexural Tension Stress (ASTM C1609), peak, minimum	2.0 ksi
Flexural Tension ratio, peak to first crack, minimum	1.25*
Long-Term Shrinkage (ASTM C157; initial reading after set)	≤ 766 microstrain
Scaling Resistance (ASTM C672)	y < 3
Abrasion Resistance (ASTM C944 2x weight; ground surface)	< 0.025 oz. lost
Freeze-Thaw Resistance (ASTM C666A; 600 cycles)	RDM > 96%
Alkali-Silica Reaction (ASTM C1260; tested for 28 days)	Innocuous

\*If the peak stress exceeds the first crack by at least 100 psi, the first crack stress need not be taken as greater than 1.8 ksi when computing this ratio.

Cast 6 additional cylinders 12 in. diameter and 7 ½ in. deep. Each cylinder shall have one grade 60 epoxy-coated reinforcing bar 32 inches long cast in the center of the circular face. The axis of the bar shall be perpendicular to the formed surface. 3 of the bars shall be #6 bars embedded 5 inches deep and 3 of the bars shall be #4 bars embedded 3 inches deep. These cylinders will be kept wet until delivered to the Materials Bureau for testing according to Test Method No. NY 701-14 E. Contact the Materials Bureau prior to casting for specific instructions on preparing the test specimens. The test will be performed as soon as practical after the corresponding samples reach 12 ksi.

This test is a pullout test. The samples pass if the stress in the bars reaches 60 ksi without the UHPC failing and without the bars pulling out of the UHPC.

**High Weight Methyl Methacrylate (HMWM)** (used to seal leaks for pours which must be watertight)  
The HMWM resin shall be low viscosity and non-fuming.

#### **ITEM 557.6601NN16 - ULTRA-HIGH PERFORMANCE CONCRETE (UHPC)**

Acceptance is based on the Manufacturer certifying that it conforms to the following, and the contractor forwarding the certification to the DCES:

Viscosity Less than 25 cps when measured according to ASTM D2849

Density Greater than 8.4 lb/gal. @ 77° F.

Flash Point Greater than 200° F.

Vapor Pressure Less than 1.0 mm Hg @ 77° F. (ASTM D 323)

TG (DSC) Greater than 136° F (ASTM D3418)

Gel Time Greater than 40 minutes for a 100 gram mass

Percent Solids Greater than 90 % by weight

Bond Strength Greater than 1522.3 psi (ASTM C882)

Sand: The sand shall be commercial quality dry blast sand. 95% of the sand shall pass the #8 sieve, and 95% shall be retained on the #30 sieve.

The container shall include the following information: The name of the Manufacturer, the brand name of the product, the date of manufacture.

#### **CONSTRUCTION DETAILS**

**Installation Drawings:** Preparation, submittal to the DCES, approval, and time for review of Installation Drawings shall be per Section 2 of the PCCM. The proposed method of mixing, placing, and curing the UHPC shall be shown on the installation drawings. When using the maturity method, the Contractor shall use the maturity method data shown on the installation drawing to demonstrate that the proposed method of curing will achieve the required strength at the required time. The Contractor shall arrange for a representative of the UHPC supplier to be on site during the placement of the UHPC until the Contractor's own staff has become well-trained in the use of the material. The representative shall be knowledgeable in the supply, mixing, delivery, placement, and curing of the UHPC.

#### **Pre-Pour Meeting**

Prior to the initial placement of the UHPC, the contractor shall arrange for an onsite meeting with the UHPC representative. The Contractor's staff and the NYSDOT Engineer and Inspectors shall attend the site meeting. The objective of the meeting is to clearly outline the procedures for mixing, transporting, finishing, and curing of the UHPC material.

#### **Storage**

The Contractor shall assure the proper storage of premix, fibers, and additives as required by the supplier's specifications in order to protect materials against loss of physical and mechanical properties.

#### **Form Work, Batching, and Curing**

The design and fabrication of forms shall follow approved installation drawings and shall follow the recommendations of the Manufacturer. A top form is required. The forms shall be coated to prevent absorption of water.

New concrete surfaces which will bond with UHPC shall have an exposed aggregate finish unless otherwise prohibited. Existing concrete surfaces shall be roughened to an amplitude of 1/8". Thoroughly and continuously wet the existing concrete contact area for 24 hours prior to placing UHPC, keep the surface wet, and remove all surface water just prior to UHPC placement.

UHPC which is placed in an area visible to traffic shall be colored similar to surrounding concrete.

The Contractor shall follow the batching sequence as specified by the supplier. The Contractor shall measure the slump flow on each batch of UHPC. The slump flow shall be conducted using a mini-slump cone. The flow for each batch shall be between 7 and 10 inches.

All UHPC shall be placed within ten feet of its final position.

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UHPC shall be filled to a minimum of plus  $\frac{1}{4}$  inch above the intended elevation. The UHPC in the form shall be cured according to Manufacturer's recommendations to attain the required strength. The excess UHPC shall then be ground flush to the required elevation.

**Estimation of In-Place Strength**

- 1) Two thermocouples shall be installed per each UHPC placement, one at each end, at half the depth of the placement, and no nearer to an edge than half the depth. The locations of these installations shall be shown on the installation drawings. These locations shall be revised if directed by the DCES. The thermocouple wiring may be connected to reinforcing steel, but probe endings shall not be in direct contact with the steel. Structural and exposure conditions shall be considered when placing thermocouples.
- 2) Listed actions are allowed when the maturity value of all the thermocouples reaches the corresponding strength values listed below.

Action	Strength Requirement
Removal of forms	10 ksi
Open Bridge deck to Traffic	12 ksi

3. Record and save the maturity data from the meter until the strength reaches 18 ksi. Disconnect the meter and clip all wires flush with the concrete surface.

A continuous read thermocouple or thermistor with a data logger can be used to estimate in place strength. The methodology outlined in ASTM C 1074-11 shall be used. The maturity function used to estimate strength shall be calculated with the same formula that is used by the maturity meter that established the initial strength maturity relationship. Copies of the calculations shall be provided to the DCES for record purposes.

**Validation of the Strength-Maturity Relationship**

For each day of placement, cast 7 – 3 inch x 6 inch cylinders to be used for validation testing. Equip one of the cylinders with a thermocouple. Test the other cylinders as close as possible to the maturity values corresponding to 8, 10, and 12 ksi. Record the maturity value immediately prior to testing. All testing shall be conducted by an AASHTO accredited testing lab. Report the results to the DCES for record purposes.

If the average value of compressive strength of each pair of cylinders is within 10% of the estimated value, the strength-maturity relationship will be validated. If the average cylinder value is more than 10% below the estimated value, the strength maturity relationship will need to be re-established. If the first four cylinders produce acceptable results, the remainder need not be tested.

The Department may perform additional testing for research purposes. Casting and testing in addition to that required in this spec will be performed by NYSDOT personnel.

In case of loss of required data, or non-verification of the strength-maturity relationship, use the cylinders cast above, one pair at a time, to verify the strength.

**Watertight Integrity Test**

After a placement has reached the required strength, a watertight integrity test shall be performed in accordance with §567-3.01.H. If leakage occurs the Contractor must seal the entire length of the placement using HMWM at no extra cost to the State.

**Sealing**

Abrasive blast-clean the area to be treated; removing all contaminants from the surface. Clean adjacent surfaces of the leaking areas using compressed air which is free of oil and moisture.

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Do not apply sealer if rain is expected within 12 hours of completion. Apply sealer to clean and dry surfaces when the surface temperature is at least 50° F and, if near 50° F, rising. The sealer shall be mixed and applied according to the Manufacturer's instructions and no more than 5 gallons at a time. Pour the sealer over the leaks.

When the HMWM is placed on a driving surface, sand must be applied to provide friction. After the resin has been applied, at least 20 minutes shall elapse before applying the sand. The sand shall be broadcast at a rate of approximately two pounds per square yard, completely covering the sealer. Once the sealer is cured, any loose sand shall be removed from the surface.

The sealer must be tack-free before construction traffic is permitted to resume.

**METHOD OF MEASUREMENT**

This work will be measured as the number of cubic feet of ULTRA-HIGH PERFORMANCE CONCRETE (UHPC) satisfactorily furnished and installed.

**BASIS OF PAYMENT**

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

<u>Item Number</u>	<u>Description</u>	<u>Pay Unit</u>
557.6701NN16	Ultra-High Performance Concrete	Cubic Feet

NN – serialized by location or by type

**ITEM 565.20210003 - ELASTOMERIC SLIDING BEARINGS (FIXED)**  
**ITEM 565.20310003 - ELASTOMERIC SLIDING BEARINGS (EXPANSION)**

**DESCRIPTION**

This work shall consist of furnishing and installing Elastomeric Sliding Bearings in accordance with the contract documents and as directed by the Engineer.

**MATERIALS**

Materials	§565-2.
Stainless Steel	§716-06
Drawings	§716-12

**CONSTRUCTION DETAILS**

Construction details shall be per §565-3.

**METHOD OF MEASUREMENT**

This work will be measured as the number of bearings satisfactorily furnished and installed.

**BASIS OF PAYMENT**

The unit price bid for each bearing shall include the cost of all labor, materials, equipment, and adjustment necessary to complete the work. All material between the bottom of the superstructure, and the top of the substructure, including anchor studs and sole plates, shall be included in the price bid for this item.

**Progress Payments.** Eighty percent of the quantity will be paid for after the bearing is installed. The remainder of the quantity will be paid for after the bearing is aligned.

<b>Pay Item</b>	<b>Description</b>	<b>Unit</b>
565.20210003	Elastomeric Sliding Bearings (Fixed)	Each
565.20310003	Elastomeric Sliding Bearings (Expansion)	Each

## **ITEM 582.99000016 - EMBEDMENT OF GALVANIC ANODES IN CONCRETE**

### **DESCRIPTION:**

The work shall consist of installing galvanic anodes and testing for electrical conductivity at locations indicated on the plans or as directed by the Engineer.

### **MATERIALS:**

A. Embedded galvanic anodes shall be compact, pre-manufactured, and consist of electrolytic High Grade Zinc in compliance with ASTM B 418 - Type 1 or Type II, cast around a pair of steel tie wires and encased in a highly alkaline cementitious shell.

The anode shall be an approved product as noted in the table below or an approved equal:

<b>Product Name</b>	<b>Manufacturer</b>	<b>Payment Factor</b>
Sentinel-GL <sup>1</sup>	Euclid Chemical Company	0.5
Galvashield XP Compact <sup>1</sup>	Vector Corrosion Technologies, Inc	0.5
Galvashield XP	Vector Corrosion Technologies, Inc	1.0
MasterProtect 8065CP	BASF Construction Chemicals, LLC – Building Systems	1.0
FerroGard 650	Sika Corp	1.0

<sup>1.</sup> Product requires approximately double the quantity of other products due to lower zinc content.

B. Reinforcement steel tie wire shall be W 0.3 (minimum diameter .0625 in), or heavier meeting the requirements of ASTM A 1064.

C. Electrical sealant shall be as specified by the anode manufacturer.

### **CONSTRUCTION DETAILS:**

The type of anode shall be as specified in the contract documents.

The Contractor shall embed Galvanic Anodes in concrete where indicated in the contract documents or where directed by the Engineer.

Installation methods shall be as specified by the anode manufacturer and shall be approved by the DCES.

**ITEM 582.99000016 - EMBEDMENT OF GALVANIC ANODES IN CONCRETE**

**METHOD OF MEASUREMENT:**

This work will be measured by the actual number of galvanic anodes installed in accordance with the contract documents multiplied by the payment factor shown in the Approved List table in the Materials section above.

**BASIS OF PAYMENT:**

The unit price bid per galvanic anode shall include the cost of all material, equipment, and labor necessary to install, connect, test the anode, and electrically seal the splices and/or connections,. Payment for concrete removal, steel reinforcement repair/replacement, and concrete replacement will be paid for under their respective items as shown in the contract documents.

## **ITEM 609.26020111 – CONCRETE CURB, STEEL FACED (NYCDOT), TYPE D**

### **DESCRIPTION**

The work shall consist of the construction of a concrete curb with steel facing as at the locations shown in and in accordance with the contract documents or as ordered by the Engineer.

### **MATERIALS**

The following sections of the standard specifications shall apply:

Portland Cement Concrete	501-2
Structural Steel Painting: Shop Applied	572-2
Curb and Curb and Gutter	609-2
Premolded Resilient Joint Filler	705-07

The following ASTM specifications shall apply:

Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates	A283
-----------------------------------------------------------------------------------------	------

**Concrete:** The material requirements of §609-2 shall apply. The material requirements, mix preparations and manufacturing of concrete shall comply with Class A concrete in §501.

**Structural Steel:** Structural steel shall conform to the requirements of ASTM Designation A283, Grade A, and shall meet the requirement of the “New York Steel Construction Manual”.

1. **Paint:** Epoxy Primer, Epoxy Intermediate Coat and Polyurethane Topcoat shall meet the requirements of §572-2 and be shop applied. The Polyurethane Topcoat shall be light gray in color such that a prepared chip shall be a reasonable visual match to Munsell Book Notation 10B 6/1. Viewing shall be done North Standard Daylight.

**Premolded Resilient Joint Filler:** Expansion joints for curb section shall be 9/32 inch wide and filled with Premoulded Resilient Joint Filler (§705-07). An expansion joint of 3/4 inch thick shall be provided in the curb on each side of drainage structures.

### **CONSTRUCTION DETAILS:**

The following sections of the standard specifications shall apply:

Structural Steel	564-3
Structural Steel Painting: Shop Applied	572-3.02
Structural Steel Painting: Overcoating and Localized	574-3.04
Curb and Curb and Gutter	609-3.04

Fabrication and construction details shall be in compliance with the detail and notes in the contract documents.



## **ITEM 609.26020111 – CONCRETE CURB, STEEL FACED (NYCDOT), TYPE D**

**Concrete Curb:** For construction of concrete curb, all the provisions of §609-3.04 shall apply except as modified by this specification.

**Steel Facing** Special steel facing for drop curbs, splays, etc., shall be constructed as detailed in the contract plans. Fabrication of the steel facing shall conform to the requirements of §564-3.

All surfaces of completed steel facing including anchors, fastening, etc., shall be thoroughly cleaned of all rust, oil, grease or foreign matter in accordance with §572-3.02. All surfaces of steel facing to be exposed after installation shall be painted in accordance with and meet the requirements of §574-3.04.

Curved steel facing shall be bent to radii designated on the plans, with tangent 36 inch lengths provided in the end sections that will incorporate the point of curvature and point of tangency of the curb radius.

### **METHOD OF MEASUREMENT**

The work will be measured as the number of linear feet of steel faced concrete curb installed.

### **BASIS OF PAYMENT**

The unit price bid per linear foot of steel faced concrete curb shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work.

Cleaning and painting of steel facing shall be included in the unit price bid.

**ITEM 613.70XX0011 - BIRD REPELLENT SYSTEM**

**DESCRIPTION**

This work shall consist of furnishing and installing a bird repellent system(s), at the locations indicated in the contract documents, in accordance with the contract documents, and as directed by the Engineer. The purpose of the bird repellent system(s) is to prevent nesting by birds on horizontal and sloped surfaces underneath bridge superstructures.

**MATERIALS**

The following reference shall apply:

Standard Specification for Sintered Ferrite Permanent Magnets	ASTM 1054
Standard Specification for Sintered and Fully Dense Neodymium Iron Boron (NdFeB) Permanent Magnets	ASTM 1101

- Magnets can be of either type unless limited to one type by the contract documents
- Magnets shall have a minimum magnetic pull force of 25 pounds vertically per 1 square inch of magnet when in flush contact with a mild steel surface
- Neodymium Iron Boron (NdFeB) permanent magnets must have a Nickel-Copper-Nickel coating

Bird repellent spike, coil, slide or netting systems, shall be from the following manufacturers:

Bird Repellent System, Spike:

Bird-Flite  
as manufactured by  
Bird Barrier America Inc.,  
20925 Chico Street  
Carson, CA 90746  
310-527-8000  
<https://birdbarrier.com>

Spikes System  
as manufactured by  
BIRD-X Inc.,  
300 N Oakley Blvd  
Chicago, IL 60612  
1-800-662-5021  
[www.bird-x.com](http://www.bird-x.com)

Bird Repellent System, Coil:

Bird Coil  
as manufactured by  
Bird Barrier America, Inc.  
20925 Chico Street  
Carson, CA 90746  
310-527-8000  
<https://birdbarrier.com>

Bird Coil Bird Repellent  
as manufactured by  
Bird Busters  
707 South Gulfstream Avenue #405  
Sarasota, FL 34236  
866-915-8225  
[www.birdbusters.com/](http://www.birdbusters.com/)

Bird Repellent System, Slide :

BirdSlide  
as manufactured by  
Bird Barrier America Inc.  
20925 Chico Street  
Carson, CA 90746  
370-527-8000  
<https://birdbarrier.com>

AviAngle  
as manufactured by  
BIRD-X Inc.  
300 N Oakley Blvd.  
Chicago, IL 60612  
1-800-662-5021  
[www.bird-x.com](http://www.bird-x.com)

Bird Slope  
as manufactured by  
Bird B Gone Inc.  
1921 E Edinger Ave.  
Santa Ana, CA 92705  
<https://www.birdbgone.com/>

**ITEM 613.70XX0011 - BIRD REPELLENT SYSTEM**

Bird Repellent System, Netting:

StealthNet System  
as manufactured by  
Bird Barrier America Inc.  
20925 Chico Street  
Carson, CA 90746  
310-527-8000  
<https://birdbarrier.com>

Bird Netting  
as manufactured by  
BIRD-X, Inc.  
300 N Oakley Blvd.  
Chicago, IL 60612  
1-800-662-5021  
[www.bird-x.com](http://www.bird-x.com)

or equal as approved by the Engineer

**CONSTRUCTION DETAILS**

Bird Repellent System(s) shall be installed according to the contract documents and manufacturer’s recommendations.

Bird repellent System, Spike; Coil; and Slide-Fixed shall be installed in strips and attached to structural steel, concrete and other surfaces through either:

- 1) The use of adhesive compounds recommended by the manufacturer of the approved system. Recommendations regarding the adhesive compounds’ drying time, if any, shall be strictly followed. The adhesive compound shall be applied in accordance with the manufacturer’s specifications.
  
- 2) When approved by EIC, the use of screws provided by the manufacturer of the approved system. The contractor shall not drill holes in any structural steel or concrete without written permission.

Bird Repellent System, Slide - Repositionable Magnet shall be installed in strips attached to structural steel through the use of magnets. Installation shall meet the following criteria:

- Removable and repositionable without damage to the slide
- Slides are secured at the base and top with magnets
- Magnets spaced a maximum of every 2’ horizontally or as specified
- Including a method of securing one slide section to an adjacent section
- Manufacturer to supply instructions for installation and removal

Bird Repellent System, Netting shall be installed to provide complete enclosure of the undersides of bridge superstructures, where shown on the contract documents. Attachment shall be with screws, clips and cables supplied by the manufacturer or, where drilling is not possible, with Velcro, caulk, or other means as recommended by the manufacturer. Care shall be taken to ensure that all required surfaces are covered.

**METHOD OF MEASUREMENT**

This work will be measured:

- As the number of **linear feet** of Bird Repellent Systems, Spike; Coil; and Slides-Fixed; or Slides – Repositionable Magnets) installed, OR
- As the number of **square feet** of Bird Repellent System, Netting installed.

**BASIS OF PAYMENT**

The unit price bid per linear foot or square foot of bird repellent system, shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

Payment will be made under:

Pay Item	Description	Unit
613.70010011	Bird Repellent System, Spikes - Single Row	LF
613.70020011	Bird Repellent System, Spikes - Double Row	LF
613.70030011	Bird Repellent System, Spikes - Triple Row	LF

**ITEM 613.70XX0011 - BIRD REPELLENT SYSTEM**

613.70040011	Bird Repellent System, Spikes - Triple Row Extra Wide	LF
613.70050011	Bird Repellent System, Coils	LF
613.70060011	Bird Repellent System, Netting	SF
613.70070011	Bird Repellent System, Slides – Fixed	LF
613.70080011	Bird Repellent System, Slides - Repositionable Magnet	LF

## **ITEM 619.10040020 - PORTABLE WORK ZONE CAMERA**

### **DESCRIPTION**

Under this work, the contractor shall furnish, install, maintain, operate, relocate, and remove Portable Work Zone Camera(s) in accordance with the contract documents and as directed by the Engineer.

### **MATERIALS**

Cameras will be required to be compact and to provide fully integrated solid-state day/night recording capability that will be used to capture full view, high resolution images of vehicles traveling through the work zone in a single lane and/or multiple lane application in all types of weather scenarios including bright sunlight, low light, and adverse conditions or inclement weather situations experienced in the northeast United States.

At a minimum, cameras shall have the following characteristics:

- The ability to record 24 hours a day, 7 days a week during construction
- Loop recording with a minimum of 2 hours of 1440p video storage before re-writing the loop. Storage shall be in the form of a removable SD card and backup storage cards shall provide the same requirements (backup storage SD cards shall be paid separately under *Item 637.34 Office Technology and Supplies*)
- 2560 x 1440 Resolution
- 30 frames per second (fps)
- H.264 and Motion JPEG video encoding
- Video Stabilization

### **CONSTRUCTION DETAILS**

Cameras shall be secured to either the front or back of a construction vehicle or on a tripod and have full view of oncoming or departing traffic, as per contractor judgement with approval from the Engineer. Cameras shall capture a direct front or rear view of oncoming or departing vehicles.

Upon the occurrence of a work zone intrusion, hostile encounter, or other event as determined by the Engineer, the Contractor will remove the storage card in the presence of law enforcement or as directed by the Engineer, and hand deliver the storage card to the Engineer or the Engineer's representative. The Contractor will immediately replace the removable storage card and turn on the camera again.

Work Zone Camera advance warning signs shall be installed within the Work Zone in accordance with the contract documents and paid separately under *Item 619.01 – Basic Work Zone Traffic Control*.

Camera installation shall include procurement, mounting, memory, and testing, including replacement of any systems and components that fail prior to the end of the performance period. During the warranty period, the Contractor will be required to perform all remedial or replacement work necessary to maintain satisfactory performance of the camera.

## **ITEM 619.10040020 - PORTABLE WORK ZONE CAMERA**

### **METHOD OF MEASUREMENT**

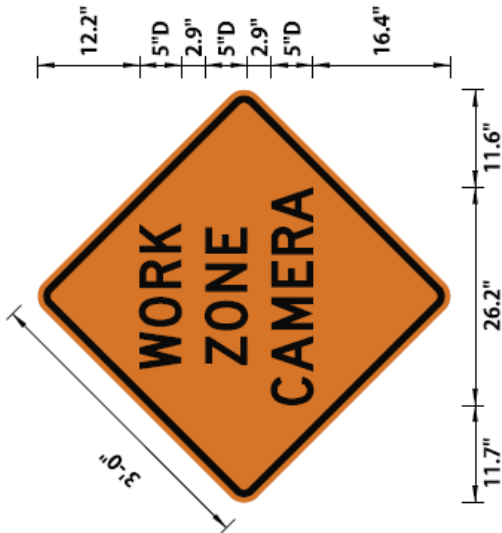
Pay unit will be Device-Day. The quantity measured for payment will be the number of devices (cameras) used each calendar day which are satisfactorily furnished, installed, maintained, and operated at each work zone location. If cameras are operated at more than one work zone location on the same day, the total number of camera-days measured for payment will be the total number of cameras setup on that day.

For the purpose of this specification, one Device-Day is defined as one camera, set up and in use in a calendar day exceeding one hour. Two Device-Days is one camera over two days or two cameras used simultaneously on one day. A camera relocated within the same work zone on the same day or same shift will count as one camera.

### **BASIS OF PAYMENT**


The unit price bid shall include the cost of all labor, materials and equipment necessary to satisfactorily complete the work. The cost of advance warning signs shall be included in the unit bid price for Item 619.01 – *Basic Work Zone Traffic Control*. The cost of additional SD storage cards will be paid for under Item 637.34 – *Office Technology and Supplies*.

**ITEM 619.10040020 - PORTABLE WORK ZONE CAMERA**



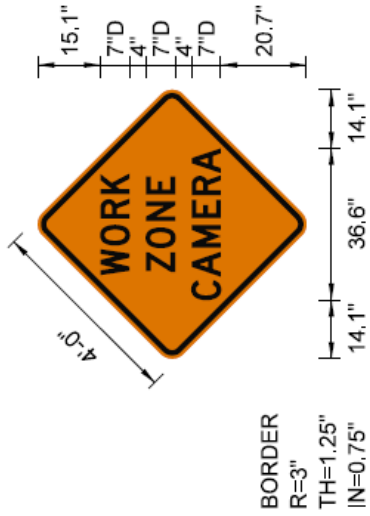
**BORDER**  
**R=1.625"**  
**TH=0.875"**  
**IN=0.625"**

Dimensions are in inches. tenths Letter locations are panel edge to lower left corner

 <b>NEW YORK</b> STATE OF DEPARTMENT OF TRANSPORTATION	<b>Department of Transportation</b>	<b>MO Traffic</b>
	LOCATION NUMBER(S):	
	MUTCD NUMBER:	
	WIDTH X HEIGHT: 4' - 1" x 4' - 1"	
	SIGN AREA: 17.0 Sq. Ft.	
	MOUNTING: Ground	
	BACKGROUND COLOR: Orange	
	LEGEND/BORDER COLOR: Black/Black	

[illegible][illegible]


**ITEM 619.10040020 - PORTABLE WORK ZONE CAMERA**

SIGN DETAIL  
1:40

Panel Style: warning-orange-48x48.ssi

Dimensions are in inches. tenths

Letter locations are panel edge to lower left corner

 <b>NEW YORK</b> STATE OF OPPORTUNITY	<b>Department of Transportation</b>	<b>MO TRAFFIC</b>
	<b>LOCATION NUMBER(S):</b>	
	<b>MUTCD NUMBER:</b>	
	<b>WIDTH X HEIGHT:</b> 5' - 5" x 5' - 5"	
	<b>SIGN AREA:</b>	29.2 Sq. Ft.
	<b>MOUNTING:</b>	Ground
<b>BACKGROUND COLOR:</b>		Orange
<b>LEGEND/BORDER COLOR:</b> Black/Black		

[illegible][illegible]



## ITEM 619.10040020 - PORTABLE WORK ZONE CAMERA

### TMI 20-01 PILOT WORK ZONE CAMERA POLICY - ADDENDUM 2

#### Notes:

1. This supplement shall be used in conjunction with the requirements of the appropriate Temporary Traffic Control Plan, including advance warning signs, protective vehicles and channelization devices for the operation when work zone cameras are utilized.
2. "WORK ZONE CAMERA" sign shall be placed approximately half way between the 1st and 2nd advance warning signs.
3. The "WORK ZONE CAMERA" is not a substitute for any advance warning sign or device AND shall be used in addition to the required advance warning signs and devices.
4. Cameras shall be placed in a location to provide optimal field of view of traffic activity within the work zone. Cameras shall NOT be placed where they pose a hazard or conflict with the safe operation of the vehicle or equipment. A cone or drum may be placed near the tripod, camera mount and advance warning signs to increase visibility / conspicuity.



 = Camera Location

 = Camera View

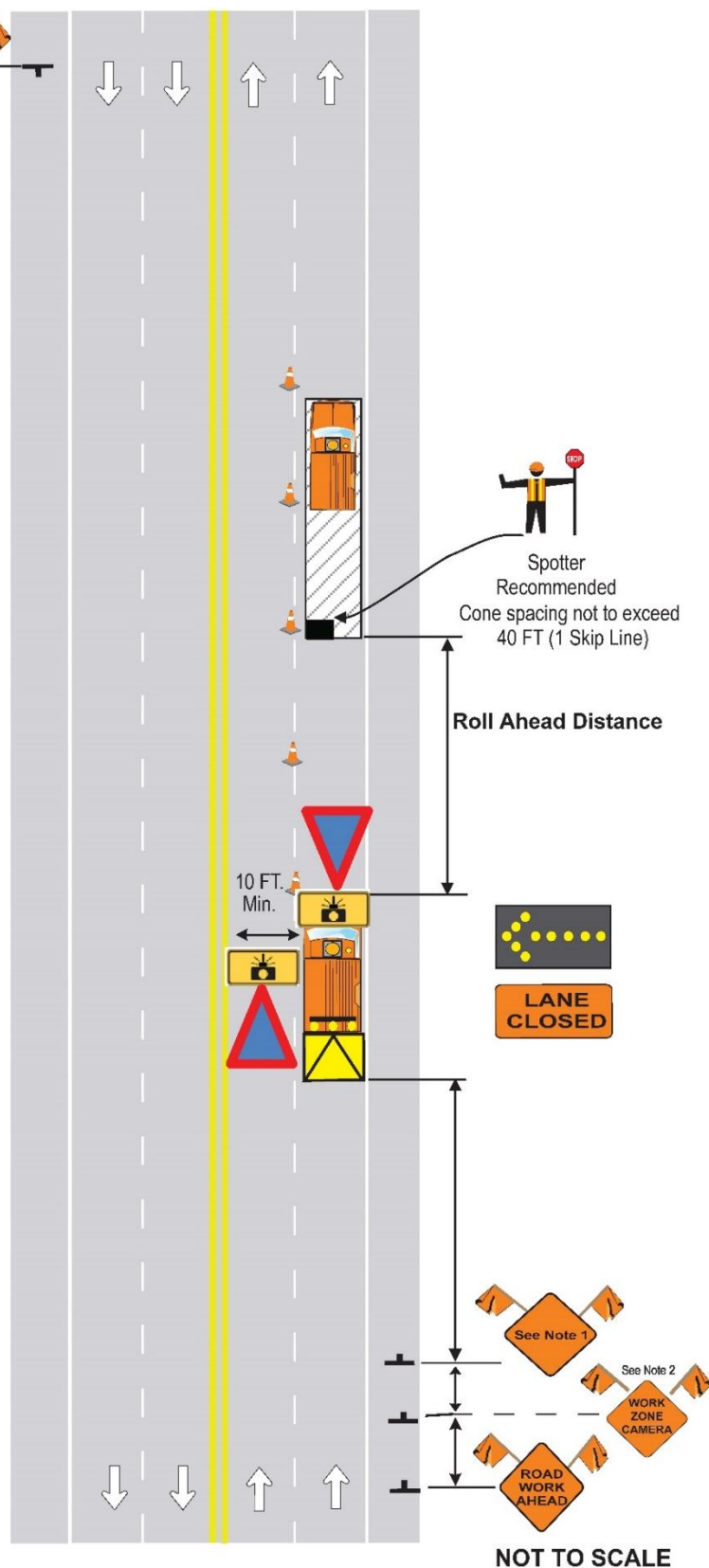
 Work Area

 Arrow Panel

 Barrier Vehicle with TMIA

 Work Vehicle

**NYSDOT OFFICE OF TRANSPORTATION  
MAINTENANCE  
SUPPLEMENTAL GUIDANCE  
FOR  
GENERAL, MOBILE, SHORT DURATION &  
SHORT TERM STATIONARY  
DAYTIME OPERATION INVOLVING  
SHOULDER OR LANE CLOSURE & WORK  
ZONE CAMERAS ON  
RURAL OR URBAN  
TWO OR FOUR LANE CONVENTIONAL  
HIGHWAY  
FEBRUARY 2020**



# ITEM 619.10040020 - PORTABLE WORK ZONE CAMERA

## TMI 20-01 PILOT WORK ZONE CAMERA POLICY - ADDENDUM 1

### Notes:

1. This supplemental guidance shall be used in conjunction with the requirements of the applicable Temporary Traffic Control Plan, including advance warning signs, protective vehicles and channelization devices when work zone cameras are utilized.
2. Work Zone Camera may be used with Automatic Flagging Assistance Devices (AFADs). This supplemental guidance shall be used in conjunction with the applicable Temporary Traffic Control Plan when work zone cameras are utilized.
3. The "WORK ZONE CAMERA" sign shall be placed between the 2nd and 3rd advance warning signs using the spacing as indicated below. The "WORK ZONE CAMERA" is not a substitute for any advance warning sign or device AND shall be used in addition to the required advance warning signs and devices.
4. Cameras shall be placed in a location to provide optimal field of view of traffic activity within the work zone. Cameras shall NOT be placed where they pose a hazard or conflict with the safe operation of the vehicle or equipment.
5. When necessary, a cone or drum may be placed near the tripod or camera mount and advance warning signs to increase visibility / conspicuity.



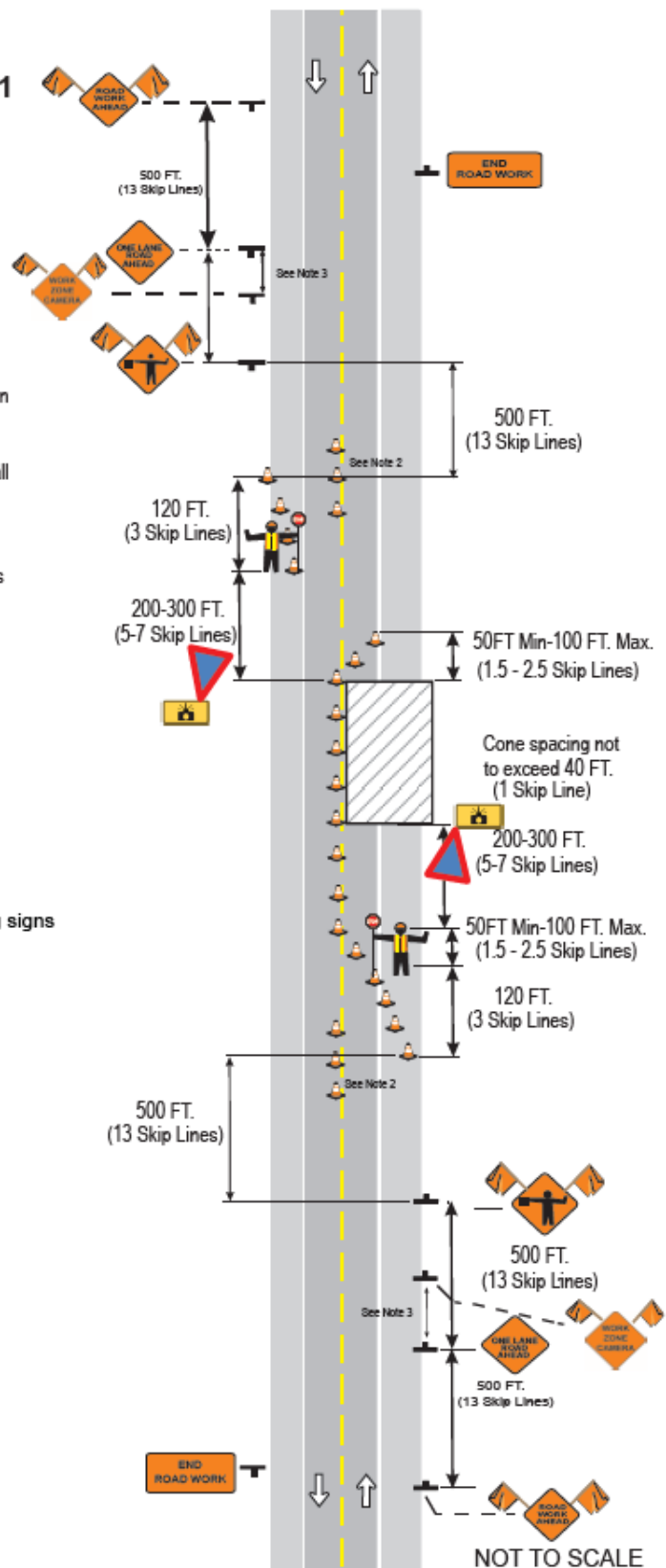
### Spacing:

Place half way between 2nd & 3rd advance warning signs

 = Camera Location

 = Camera View

NYS DOT OFFICE OF TRANSPORTATION  
MAINTENANCE  
SUPPLEMENTAL GUIDANCE FOR  
DAYTIME  
SHORT-TERM STATIONARY  
OPERATION INVOLVING  
LANE CLOSURE, FLAGGERS  
& WORK ZONE CAMERAS  
RURAL  
TWO-LANE CONVENTIONAL HIGHWAY  
FEBRUARY 2020



**ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.**  
**BAITING AND SANITATION**

**ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE**  
**PROGRAM**

**DESCRIPTION**

- A. Under these items the Contractor shall perform and satisfy the rodent and vermin control (extermination) and site sanitation requirements within construction areas as designated by the engineer.
- B. The contractor shall maintain a cooperative dialogue with appropriate agencies and management representatives of neighborhood properties.
- C. The contractor shall perform the rodent and vermin control tasks described herein and also respond to other pest control needs when directed by the Engineer.

**MATERIALS**

**1. Products**

- A. Furnish and use only pesticide formulations registered by the U.S Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (DEC) where appropriate, according to label directions and as acceptable to the Engineer.
- B. Furnish and use devices and supplies (e.g., traps and bait stations) to facilitate the effectiveness and safety of the pest control program as appropriate and as acceptable to the Engineer.

**2 Containers**

- A. Use heavy duty refuse containers with tight-fitting domed lids, with a spring loaded flap, for disposal of all garbage and trash associated with food. Maintain these containers so there are no opening that allow access by rodents or vermin.
- B. If a dumpster is necessary for the temporary storage of garbage and trash associated with food, it shall not have openings that allow access by rodents or vermin. The dumpster shall have a drain plug if a drain is present, and the doors shall be maintained tightly closed.

**CONSTRUCTION DETAILS**

This work is to be performed prior to the start of construction and also throughout construction, so that Rodents (rats and mice) and Vermin (cockroaches, beetles, and other insects) do not disperse from or infest construction area or adjacent residential areas.

**1. Submittals**

**ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.**  
**BAITING AND SANITATION**

**ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE**  
**PROGRAM**

- A. Submit to the Engineer copies of pesticide applicators certification and licenses within ten (10) days of their issuance or renewal for the duration of this Contract
  - B. After performing the survey described under Construction Details Section 6 and before initiating baiting, submit to the Engineer a written description of proposed pest control procedures, indicating materials, quantities, methods, and time schedule. For all pesticide be used, submit a copy of pesticide manufacture's EPA - approved pesticide label with application directions.
  - C. Submits to the Engineer documentation of pest control activities and results as follows:
    - 1. Monthly - Submits data sheets with location of sites treated, methods and data application, amounts and types of bait used, pesticides dosage, number and types of traps set, survey and inspection results, sanitation condition complaints calls investigated, any problems that occurred and signature of applicator.
    - 2. Monthly — submit a map that shows bait station, manholes and catch basins where baits are being maintained.
  - D. At least 10 days prior to occupancy of Contract area, submit to the Engineer for review a written description of the sanitation procedures to be used.
2. Qualifications:
- A. The Contractor shall perform this work at all times in accordance with the following minimum standards and as acceptable to the Engineer.
  - B. The Contractor, key personnel and applicator shall have experience and/or training in vertebrate pest management and integrated pest management; have experience with various rodent and vermin control techniques, equipment, and strategies; and have knowledge of and experience with techniques to reduce non-targets hazards.
  - C. Applicators shall be licensed and certified by New York State DEC.
3. Coordination:
- A. The contractor shall not proceed with the construction designated on the Plans until written release is issued by the Engineers, after successful completion of the initial phase of rodent and vermin control.
  - B. Initiate the work before field mobilization begins for the construction designated on the Plans and within adequate timing to achieve control before

**ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.**  
**BAITING AND SANITATION**

**ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE**  
**PROGRAM**

environmental disruption and site work. Provide a maintenance program until construction is completed and all equipment and materials are removed, as determined by the Engineer.

- C. Perform this work in such a manner and post warning signs such that toxicants or other control tools do not pose hazards to persons, domestic animals, or non-targets wildlife.

4. Permits:

- A. Obtain and maintain in coordination with the Engineer appropriate permit(s) from city or state agencies for pest control activities associated with this work.
- B. Obtain and maintain in coordination with the Engineer all right of entry permits required for the performance of this work. This includes all utilities and private properties to which entrance is required.

5. Meetings:

- A. Before proceeding with the work, all pest control personnel shall attend a two hour orientation session held by the Engineer and discuss planned pest control methods and coordination.

6. Survey:

- A. Prior to baiting, survey the proposed construction area with representatives of adjacent buildings and record signs of rodent and vermin activity and sanitation conditions. Maintain survey in the manner described under Construction Details Section 10.
- B. Thoroughly inspect construction areas and accessible or observable bordering area designated herein, and any nearby area designated by the Engineers, for rodent and vermin activity and sanitation deficiencies monthly throughout the duration of this contract and in accordance with the work schedule. Maintain inspection records in the manner described under Construction Details Section 10.

7. Application for Rodent and Vermin Control:

- A. Apply rodenticide and insecticide in strict accordance with EPA-approved label directions and NYSDEC and NYCDEP regulations. Maintain records of all bait placements in the manner described under Construction Details Section 10.
- B. Where appropriate, use properly secured and tamper-resistant bait stations consistent with EPA regulations. Remove manhole covers and ventilate manholes according to requirements of appropriate municipal agencies and

**ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.**  
**BAITING AND SANITATION**

**ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE**  
**PROGRAM**

utility companies. Use a police, or utilities details as appropriates. Coordinate the work with appropriate municipal agencies and utility companies. Individually number and property identify all bait stations.

- C. Baited area must be posted with warning signs advising the public that bait has been placed in the area. The signs are to be large (18 inches X 22 inches) and clearly printed at all baits stations.

- D. Surface Applications

- 1. Initial Surface Bating

- Rid the construction area of all detectable rodents and vermin before construction begins, as acceptable to the Engineer. Bait all observable rodent burrows and areas of vermin infestation. Install and secure bait stations at regular and appropriate intervals and locations, and document rodent or vermin activity (burrows, dropping, bait consumed, dead rodents). Replenish bait and shift stations as necessary to ensure complete control of rodent and vermin populations. Bait edge and accessible bordering areas designated on the Plans as necessary to ensure that rodents and vermin shall not infest work areas.

- 2. Maintenance Surface Baiting

- Establish a maintenance baiting program prior to the start of construction. This includes construction areas and accessible bordering areas designated herein, as acceptable to the Engineer. Check bait placements weekly. Use survey and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute bait and bait stations as appropriates to ensure continuous control.

- E. Subsurface Applications

- 1. Initial Subsurface baiting

- Apply appropriate baits to control rodent and vermin populations in manholes and catch basins, This shall involve suspending and securing bait using noncorrosive wire (e.g., 24 gauge plastic coated). Place bait in all accessible manholes and catch basins within the construction work area. In addition, bait an appropriate set of manholes and catch basins in the blocks bordering the work area as designated herein and as acceptable to the Engineer. Identify all baited manholes and catch basins with a standardized paint mark on the street and, a numbered tag to be

**ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.**  
**BAITING AND SANITATION**

**ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE**  
**PROGRAM**

attached to the suspending wire. Approximately seven days after completion of the first baiting, check all manhole and catch basin baits and record estimates on the amount of bait consumed. Replenish or increase the amount of bait applied according to the amount consumed and as acceptable to the Engineer. Repeat this process again approximately fourteen days later and until there is little or no bait consumed. Check manholes and catch basins weekly when they repeatedly have 100 percent of the bait consumed.

2. Maintenance Subsurface Baiting

Prior to the start the construction, establish a maintenance baiting program appropriate for the rodent or vermin infestation patterns identified during initial program appropriate for the rodent or vermin infestation patterns identified during initial subsurface baiting. This program shall ensure continued control and shall be performed acceptable to the Engineer. Maintain bait in manholes and catch basins that have rodent or vermin activity and those that had activity during initial baiting as necessary. Check each bait weekly or more often according to rodent or vermin activity levels and the recent history of bait consumption. Use utility maps and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute baiting locations as necessary to ensure adequate interception option points for controlling immigrating rodents or vermin.

F. Cleanup

1. Remove visible rodent carcasses and dispose of them daily consistent with the pesticide label directions and applicable codes, laws, and regulations.
2. Upon completion of any pest control operations at the site, remove remaining bait and dispose of it according to the pesticide label and applicable codes, laws, and regulations. Also remove all wires used for subsurface baiting and any bait stations or traps.

8. Sanitation:

Prior to construction and throughout the duration of this Contract, identify and document harborage and food sources available to rodents on the construction site and in observable bordering areas designated herein. This includes any littering or improper or insufficient use of trash receptacles in construction or structural deficiencies that violate City or State sanitation codes.

**ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.**  
**BAITING AND SANITATION**

**ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE**  
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Maintain records of sanitation conditions in the manner described under Construction Details Section 10.

- A. Maintain Construction and laydown areas and their perimeters free of trash, garbage, weeds, debris and unnecessary or deteriorated hay and straw bales. Provide and enforce proper use of refuse containers to ensure that rodents and other pests are not harbored or attracted.
- B. Designate specific locations as lunch and coffee break areas to prevent random disposal of garbage and trash. Keep those areas free of litter and garbage, and provide refuse containers. Keep refuse containers upright with their lids shut tight.
- C. Have all refuse containers (described in Materials Section 2), emptied daily to maintain site sanitation. If a dumpster is used (as described in Materials Section 2) empty it at least weekly and keep the area under and around it clean.
- D. Notify the Engineer within 24 hours whenever rodents (rats or mice) or signs of rodent activity (burrows or droppings) or vermin are observed in construction or laydown areas.

9. Complaint Calls

- A. During construction, respond to pest-related complaints from the adjacent neighborhood within 12 hours when directed by Engineer. Inspect the particular premises and adjacent areas for sanitation and structural deficiencies and also signs of historic and recent pest activity. Provide sanitation and structural maintenance information to the property owner or manager. Use pesticides or traps as necessary and appropriate to resolve the complaint when there is a relationship between the pest infestation and construction activities, or when directed by the Engineer.
- B. Maintain records of all complaints investigated, including location, contact person, inspection results, and actions taken. Document the relatedness of the pest infestation to construction activities.

10. Record Keeping

- A. Use standard data sheets provided or approved by the Engineer to maintain accurate records of date, placement, type, and amount of pesticides or other control tools (e.g.. traps) applied. Similarly, maintain records of surveys, inspection, changes in pest activity, sanitation conditions, or when directed by the Engineer.



**ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.**  
**BAITING AND SANITATION**

**ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE**  
**PROGRAM**

**METHOD OF MEASUREMENT**

The quantity to be paid for under the item Initial Survey, Baiting and Sanitation, Will be on a lump sum basis for the initial work completed in accordance with the plans, specifications and direction of the Engineer.

The quantity to be paid for under the item, Maintenance Program, will be on a per month basis for the maintenance program completed in accordance with the plans, specifications and direction of the Engineer.

Extermination work to be performed under Item 202.01nnnn - Disposal of Buildings will be measured and paid for under Item 202.01nnnn - Disposal of Buildings.

**BASIS OF PAYMENT**

The lump sum price bid for the item, Initial Survey, Baiting and Sanitation, shall cover the cost of all labor, material and equipment necessary to complete the initial survey, planning, documentation, baiting and inspection of the construction and adjacent areas both surface and subsurface as well as sanitation inspection, documentation and corrective measures.

The unit price bid per month for the item, Maintenance Program, shall cover the cost of all labor, materials and equipment necessary to complete the weekly inspections, rebaiting, cleanup and rodent and vermin control documentation, garbage disposal cleanup and sanitation documentation as well as to receive, document and respond to complaints.

**ITEM 634.99010017 - BUILDING CONDITION SURVEY**

**ITEM 634.99020017 - VIBRATION MONITORING (NONBLASTING)**

**DESCRIPTION**

**A. Building Condition Survey.** This work shall consist of performing a building condition survey(s) and preparing permanent records as indicated in the contract documents prior to the commencement of work, after completion of work, and at locations and times during construction as directed by the Engineer.

**B. Vibration Monitoring (Nonblasting).** This work shall consist of performing vibration monitoring of background and construction activities and preparing daily and summary report(s) of vibration readings.

**MATERIALS**

**A. Building Condition Survey.** Provide general photography and video equipment, analog or digital, capable of superimposing the date and time on all images.

**B. Vibration Monitoring (Nonblasting).** Provide a 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions. Annual factory calibration is required throughout the duration of the work.

**CONSTRUCTION DETAILS**

**A. General.** The Contractor shall engage the services of a firm capable of furnishing a New York State licensed Professional Engineer to conduct a condition survey of the existing building(s) indicated in the contract documents in the Special Note entitled Vibration Criteria and an experienced vibration monitoring Consultant to measure peak particle velocities prior to, and during, construction operations. Submit as proof to the Deputy Chief Engineer Technical Services (DCETS) the experience and qualifications of the firm's personnel conducting the work.

**B. Building Condition Survey.** Provide, as a minimum, the following information:

1. Photographic and videotape documentation of the interior and exterior condition of the building(s).
2. Extent and location of existing signs of building distress such as cracks, spalling, signs of settlement, flooding, leaking, etc.

The Engineer may accompany the Contractor on each building condition survey for verification of the data recorded. Provide two copies of all documentation of each building condition survey to the Engineer.

**C. Vibration Monitoring (Nonblasting).** The DCETS may waive the requirements of vibration monitoring based on the results of the building condition survey.

Perform continuous vibration monitoring during construction operations when adjacent construction activities make monitoring prudent. The Contractor shall perform contract work in

**ITEM 634.99010017 - BUILDING CONDITION SURVEY**

**ITEM 634.99020017 - VIBRATION MONITORING (NONBLASTING)**

a manner that will limit construction vibration at the specified locations to within the limits set within the contract documents.

**1. Submittal of Written Vibration Monitoring Plan.** Prior to performing work adjacent to specified locations, a written Vibration Monitoring Plan prepared by the Contractor shall be submitted to the Engineer a minimum of 10 work days in advance for approval. The Engineer will send a copy of the Vibration Monitoring Plan to the Geotechnical Engineering Bureau, Engineering Geology Section, for review and written comment. The vibration monitoring plan may be returned to the Contractor for revision or clarification.

The vibration monitoring plan shall include the necessary information to outline the recording collection. The vibration monitoring plan shall include, but not be limited to, the following items:

**a. Contract Designations**

- The name of vibration monitoring specialist(s).
- The scheduled start date and length of construction operations which require vibration monitoring.
- The limits of vibration monitoring work, including sites on or off State-owned right-of-way.
- The location of all structures to be monitored in proximity to the construction operation.
- The location of any underground utilities in proximity to the construction operation.

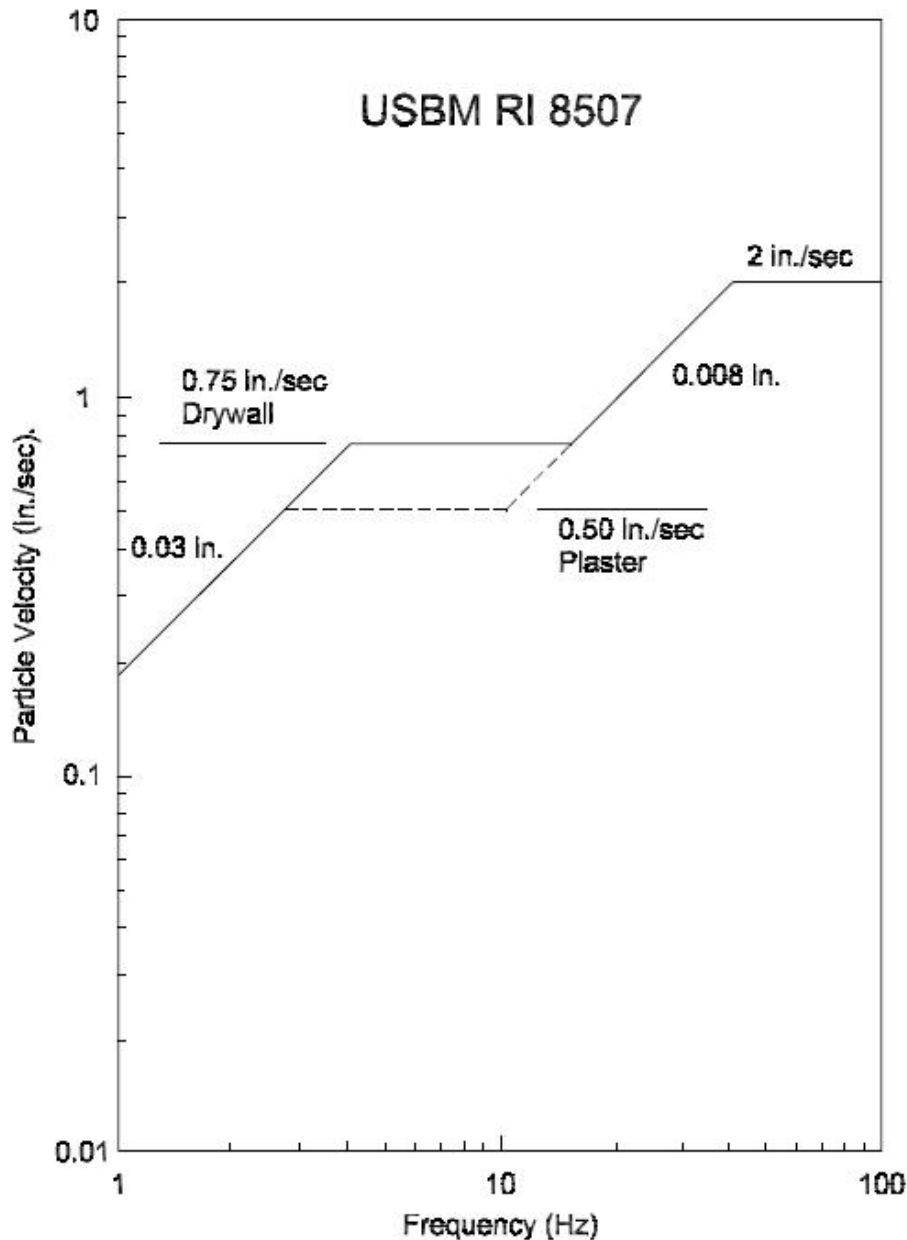
**b. Experience and Equipment**

- Submit proof and details, as references, of two projects in the past five years where the vibration monitoring consultant performing the work has satisfactorily monitored construction operations by recording maximum peak particle velocities (PPVs). Include contact information for each reference.
- Submit information on the required 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions, including: the manufacturer's name, model number, and documentation of factory calibration performed within the last 12 months.

**c. Methods and Procedures**

- The location of adjacent structures to be monitored and maximum allowable PPVs as indicated in the contract documents. If not otherwise specified, a maximum allowable PPV in accordance with the United States Bureau of Mines (USBM) Vibration Criteria (Figure 1) shall be observed at all structures.
- The location of seismograph(s) placements, as directed by the Contractor's Professional Engineer. Recording seismographs may be installed on selected structures.
- Appropriate details for anchoring the geophone(s).

- The procedure for tracking PPV throughout construction operations (e.g., Pile Driving Operations: pile tip vs. vibrations may be correlated through time of day. A record of the time of day at each depth interval, included on the pile driving records, would be required to correlate to a time-based readout of PPV).



**Figure 1—Safe Vibration Limit Recommendations for Residential Structures**

**Figure 1 – USBM Vibration Criteria (after Siskind et al, 1980)**

*The figure provides a “threshold damage” limit, defined as cosmetic damage (e.g., cracking) within the structure, categorized by both frequency ranges and particle velocity*

**ITEM 634.99010017 - BUILDING CONDITION SURVEY**

**ITEM 634.99020017 - VIBRATION MONITORING (NONBLASTING)**

**2. Measuring Vibrations.** The Contractor shall inform the Engineer immediately each time measured particle velocities exceed 85% of the allowable peak particle velocity. The Contractor shall make equipment or procedural modifications as required to avoid exceeding the allowable vibration intensity.

If the measured velocities exceed the maximum allowable PPVs, the Contractor shall stop operations immediately and revise equipment and procedures to reduce vibrations to allowable levels.

The Contractor shall be in communication with his monitoring firm's personnel during vibration monitoring at all locations to verify the data recorded.

The Contractor shall provide the Engineer with the results of daily vibration monitoring, one work day after the readings are taken. Upon completion of the construction operations for those locations requiring vibration monitoring, the daily submittals shall be synthesized into a final report.

If the seismographs show any indication of damage or vandalism, the seismographs shall be immediately recalibrated or replaced.

**METHOD OF MEASUREMENT**

**A. Building Condition Survey.** This work will be measured on a lump sum basis.

**B. Vibration Monitoring (Nonblasting).** This work will be measured on a lump sum basis.

**BASIS OF PAYMENT**

The unit price bid for building condition survey(s) and vibration monitoring shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

**Vibration Monitoring (Nonblasting).** Progress payments will be made for this item paid proportionally in accordance with the amount of work completed, measured on a workday basis.

Payment will be made under:

<b>Item No.</b>	<b>Item</b>	<b>Pay Unit</b>
634.99010017	Building Condition Survey	Lump Sum
634.99020017	Vibration Monitoring (Nonblasting)	Lump Sum

## **ITEM 637.31XX0020 – INSPECTION VEHICLES (MAXIMUM BID)**

### **DESCRIPTION**

This work shall consist of providing and maintaining motor vehicle(s) for exclusive use by the Engineer and the Inspection Staff.

### **MATERIALS**

The vehicle(s) provided shall not be over 4 years old or have over 50,000 miles on the odometer as of the delivery date. The vehicle(s) shall be properly registered and be provided with an owner's policy of liability insurance in conformance with §107-06B. *Insurance Requirements*. The vehicles shall be in safe and serviceable operating condition with automatic transmissions and air conditioning.

**A. Compact Sedan.** The Contractor shall provide a Ford Focus or similar compact sedan.

**B. Midsize/Intermediate SUV.** The Contractor shall provide a Jeep Patriot or similar midsize/intermediate SUV. The SUV shall have all-wheel, or 4-wheel drive capability.

**C. Small/Standard Pickup Truck.** The Contractor shall provide a Chevrolet Colorado or similar small/standard pickup truck. The pickup truck shall have 4-wheel drive capability.

### **CONSTRUCTION DETAILS**

Prior to the start of any contract work, the Contractor shall make the inspection vehicle(s) available for inspection by the Engineer. The Contractor shall make arrangements for delivery to the site on a date agreed to by the Engineer. If more than one vehicle is required, the number required will be shown in a Special Note entitled *Contractor Supplied Inspection Vehicles*.

Inspection vehicles will be operated by Department and consultant inspection staff possessing a valid driver's license as authorized by the Engineer and for official State business purposes only. The vehicle operator is personally liable for any traffic infractions, including parking tickets, or EZ Pass violations.

The Contractor shall provide all proper and scheduled maintenance (oil changes, tires) to keep the vehicle(s) in safe and serviceable operating condition and undertake all repairs as required, including repairs arising from vandalism, accidents or other damages. If a vehicle becomes unavailable for any reason or requires maintenance or repairs which cannot be completed on the same day, a comparable replacement vehicle shall be provided while the vehicle is out of service. The Department will provide fuel and EZ Pass for the vehicle(s).

### **METHOD OF MEASUREMENT**

Each inspection vehicle will be measured for payment on a monthly basis, measured to the nearest 0.25 months.

### **BASIS OF PAYMENT**

The unit price bid per month shall include all costs in connection with furnishing properly registered vehicle(s), maintaining and repairing the vehicles as required and providing an owner's policy of liability insurance for the vehicles in conformance with §107-06B. *Insurance Requirements*. A deduction of 1/30 of a month will be made for each 24-hour period, or portion thereof, during which the vehicle is unavailable to the Engineer, regardless of the reason for the vehicle's unavailability. Payment may be terminated on a specified date prior to contract final acceptance by written notification from the Engineer that a vehicle will no longer be required.

**ITEM 637.31XX0020 – INSPECTION VEHICLES (MAXIMUM BID)**

*Payment will be made under:*

<b><u>Item</u></b>	<b><u>Description</u></b>	<b><u>Unit</u></b>
637.31010020	Inspection Vehicles, Compact Sedan	Month
637.31020020	Inspection Vehicles, Midsize/Intermediate SUV	Month
637.31030020	Inspection Vehicles, Small/Standard Pickup Truck	Month

**MAXIMUM BID ITEM**

The maximum bid allowed per vehicle(s) per month shall be that shown in the proposal. The Contractor may bid less than the maximum bid, but any bid exceeding the maximum bid will be disregarded and changed to the amount shown in the proposal.

## **ITEM 637.4000nn20 - WEBCAM SYSTEM**

### **DESCRIPTION**

This work shall consist of providing, installing, maintaining and removing a webcam system, with a camera mounted on wood utility pole. A single website for image storage and online access may be used for multiple cameras, provided the images are organized and available for each camera separately.

### **MATERIALS**

The webcam system shall meet the following material requirements:

#### **Camera**

- The high definition camera and lens assembly shall take high resolution (minimum 16 megapixel - 4928 x 3264) digital still color images and have digital pan, tilt, and zoom capabilities
- Imager: 23.6 X 15.6 CMOS.
- Auto Features: Focus, Shutter, ISO, and white balance.
- Powered by 120 VAC electrical supply, GFCI protected (provided, installed, maintained and removed by Contractor).

#### **Camera Enclosure**

- The camera enclosure shall be UL compliant and shall meet NEMA Type 3R standards.
- Include provisions for a fixed installation to a pole or wall.
- Shall include a thermal insulation package, heater, blower, window defroster kit, sun shroud and shall operate within a minimum temperature range of -10°F to 110°F.
- Powered by 120 VAC electrical supply, GFCI protected (provided, installed, maintained and removed by Contractor).

#### **Interface and Online Access**

- The system must provide wireless cellular modem as an option for uploading the digital still images.
- The online interface system shall allow viewing of all high-definition digital still images captured and stored during the duration of the contract over the internet with password-protection.
- The still images shall be in a non-proprietary format that can be freely viewed with most image viewing software (.bmp, .jpeg, .tif or .gif)
- Navigation: Calendar based navigation system for selecting specific images on specific days.
- Capable of viewing actual live video.
- HD Snapshot on Demand: HDR (High Dynamic Range) Imaging and Additional Special Effects Including Architectural Miniature, Artistic Color Sketch and Cinematic Black & White
- Graphical mark-up tools for detailing and creating overlays on images.
- Graphical weather applet displaying ten points of local weather data and 48-hour forecast.
- Remote cellular monitoring screen displaying connectivity, network traffic and modem temperature.
- Remote wireless radio monitoring screen displaying connectivity, network traffic and Google Map features including wireless radio locations.
- Image Comparison: Capability to choose and overlay images from two different dates in the same viewing window
- Zoom: Pan and zoom capability for zooming into the high definition images.
- Remote Solar Monitoring Screen Displaying the DC Amperage Output of Solar Panels.
- Fullscreen: Screen maximizing the view of the images on the users monitor.
- Slideshow: Capability to browse through images, moving forward and backward in time by individual image and by day.
- Picture in Picture to view live video, while viewing high definition images.



## **ITEM 637.4000nn20 - WEBCAM SYSTEM**

- All Images are the Copyright of the Department and Protected on Secure Servers Owned and Operated by the System Vendor.

### **Embedded Wood Utility Pole**

- The pole shall be a minimum 60 feet in length, Southern pine and meet the requirements of ANSI #05.01 for Class 4 utility type poles.
- The pole shall be given a water borne preservative treatment in accordance with §708-31.

## **CONSTRUCTION DETAILS**

The Contractor shall provide, install and maintain a fully functional webcam system including an electrical power supply, camera hardware, mounting pole and equipment, data connections, image storage, online interface for the system and technical support. The Contractor is required to have the webcam system's vendor made available for support services and equipment maintenance/repairs.

The Contractor shall provide, install, maintain and remove the webcam system. The Contractor shall coordinate with the Engineer to install the camera in an approved location and provide password access to the webcam system's Internet site. The camera shall be installed so that the position of the sun or any man-made light source does not point directly into the camera. The camera shall be tested at the site both prior to and subsequent to installation, including having the webcam system's vendor remotely confirm both successful tests. The Contractor shall clean the installed components in accordance with manufacturer's recommendations at least monthly, or as needed to ensure image clarity.

The pole shall be installed plumb, in a hole of sufficient depth to allow for a minimum of 10 feet embedment. The area around the pole shall be backfilled with suitable material and thoroughly compacted. The Contractor shall restore, in kind, all areas which were disturbed by the pole installation operation.

The webcam system shall consist of all-weather, tamper/impact resistant, fixed mounted camera enclosure with integrated, fixed high definition camera. The camera shall have the ability to take a high-resolution digital still color image of the construction site at a set time interval, at least every fifteen (15) minutes, and securely upload the still images to a secure, password-protected website. The image data shall at all times be the property of the State. The digital still images shall be stored on a remote server (with sufficient storage capacity to store all images taken on the contract) and be made available for viewing on the website in chronological order. The website shall provide the ability to zoom in on the images. Password access to the website shall be granted to those parties specified by the Engineer (Department staff and the Contractor, at a minimum). The Contractor shall provide the Department with an archive in DVD or external hard drive format of all the digital still images in a sortable/identifiable format. The still image file names shall include the date and time taken.

The Contractor shall maintain all equipment in working condition and shall provide replacement due to breakdown, damage, or theft within two (2) work days. The Contractor's webcam system vendor shall proactively monitor the webcam system and if no system connection is made within normal working hours, not to exceed 24 hours, the vendor shall notify the Contractor and begin troubleshooting.

The Contractor shall remove all webcam system equipment and wood utility pole within ten (10) work days after the Engineer requests the removal in writing. The webcam system equipment and pole shall remain the property of the Contractor. The State shall retain ownership of all data collected by the webcam system.

The webcam system shall be operated in accordance with the "Policy for the Operation of Webcam Systems on Construction Contracts", a copy of which will be provided to the Contractor by the Engineer.

## **ITEM 637.4000nn20 - WEBCAM SYSTEM**

### **METHOD OF MEASUREMENT**

The webcam system will be measured for payment on a monthly basis, measured to the nearest 0.25 months.

### **BASIS OF PAYMENT**

The unit price bid per month for the webcam system shall include the cost of all labor, materials and equipment, including services to provide, install, maintain and remove all components of the webcam system and wood utility pole. A deduction of 1/30 of a month will be made for each 24-hour period, or portion thereof during which the webcam system is not operational. Payment will begin the first month the webcam system is installed, operational and made available for use, including having the website established and functional. Monthly payments will be terminated no later than two (2) weeks after written notification by the Engineer that the webcam system will no longer be required.

## **ITEM 800.01000015 – DESIGN BUILD – DESIGN SERVICES**

**DESCRIPTION.** This work shall consist of providing design services in accordance with the contract documents.

**MATERIALS.** None Specified.

**CONSTRUCTION DETAILS.** The Design Builder shall provide Design Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

**METHOD OF MEASUREMENT.** Design Build - Design Services will be measured for payment on a lump sum basis.

**BASIS OF PAYMENT.** The lump sum price bid for Design Build - Design Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.

**ITEM 800.02000015 – DESIGN BUILD – CONSTRUCTION INSPECTION SERVICES**

**DESCRIPTION.** This work shall consist of providing Construction Inspection Services in accordance with the contract documents.

**MATERIALS.** None Specified.

**CONSTRUCTION DETAILS.** The Design Builder shall provide Construction Inspection Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

**METHOD OF MEASUREMENT.** Design Build - Construction Inspection Services will be measured for payment on a lump sum basis.

**BASIS OF PAYMENT.** The lump sum price bid for Design Build - Construction Inspection Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.

**ITEM 800.03000015 – DESIGN BUILD – QUALITY CONTROL SERVICES**

**DESCRIPTION.** This work shall consist of providing Quality Control Services in accordance with the contract documents.

**MATERIALS.** None Specified.

**CONSTRUCTION DETAILS.** The Design Builder shall provide Quality Control Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

**METHOD OF MEASUREMENT.** Design Build - Quality Control Services will be measured for payment on a lump sum basis.

**BASIS OF PAYMENT.** The lump sum price bid for Design Build - Quality Control Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.

## **ITEM 800.0400NN15 – DESIGN BUILD – EXTRA WORK**

**DESCRIPTION.** This work shall consist of performing work in accordance with the contract documents and as directed by the Department's Project Manager. This item provides a contract contingency allowance for the timely payment of authorized extra work.

**MATERIALS.** None Specified.

**CONSTRUCTION DETAILS.** The Design Builder shall perform work in accordance with the contract documents and as directed by the Department's Project Manager. The Design Builder shall maintain and submit Agreed Price Work or Force Account Work records in accordance with DB section 109-05 *Extra Work and Time Related Compensation*.

**METHOD OF MEASUREMENT.** Design Build – Extra Work will be measured for payment on a Dollar Cents basis.

**BASIS OF PAYMENT.** The price shown for Design Build - Extra Work shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work. The total cost shown in the price proposal will be considered the price bid even though payment will be made only for actual work performed. The unit price amount is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figure will be disregarded, and the original price will be used to determine the total amount bid for the contract. Progress payments will be made in accordance with the contract documents.

Note: NN in pay item number denotes serialization.

## **ITEM 800.05000015 – DESIGN BUILD – SITE MOBILIZATION**

**DESCRIPTION.** This work shall consist of providing necessary bonds, insurance, prefinancing and set up of necessary general plant, including shops, storage areas, office and such sanitary and other facilities as are required by local or state law or regulation.

**MATERIALS.** None Specified.

**CONSTRUCTION DETAILS.** The Design Builder shall provide the above facilities and service for mobilization in a safe and workmanlike manner in conformance with any pertinent local or State Law, regulation or code to the extent and at the time the Contractor deems them necessary for its operations. Good housekeeping shall be maintained.

**METHOD OF MEASUREMENT.** Design Build – Site Mobilization will be measured for payment on a lump sum basis.

**BASIS OF PAYMENT.** The lump sum price bid for Design Build – Site Mobilization shall not exceed four percent (4%) of the total contract bid price for all Construction Work items. Should the bidder exceed the foregoing four percent (4%), the Department will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

Progress payments in the amount of 4% of the construction work items will be made to the Contractor with the first contract payment made for other contract work at the individual itemized work site.

## **ITEM 800.0600NN15 – DESIGN BUILD – CONSTRUCTION WORK**

**DESCRIPTION.** This work shall consist of construction work in accordance with the contract documents.

**MATERIALS.** None Specified.

**CONSTRUCTION DETAILS.** The Design Builder shall perform all construction work in accordance with the requirements in the contract documents.

**METHOD OF MEASUREMENT.** Design Build – Construction Work will be measured for payment on a lump sum basis for each location. The individual locations are identified in the contract documents.

**BASIS OF PAYMENT.** The lump sum price bid for Design Build – Construction Work shall include the cost of furnishing all labor, materials, equipment, management and supervision to satisfactorily complete the work. Progress payments will be made for each construction work location in accordance with the contract documents.

Note: NN in pay item number denotes serialization by location.



## **ITEM 800.1000NN15 – DESIGN BUILD – UTILITY RELATED WORK**

**DESCRIPTION.** This work shall consist of utility related work in accordance with the contract documents or owner requirements. The “owner” of each utility is identified in the contract documents.

**MATERIALS.** Materials shall be as specified in the contract documents or owner requirements. If none specified, then the proposed material shall be approved by the Engineer of Record before any purchase is made.

**CONSTRUCTION DETAILS.** The Design Builder shall perform all utility related work in accordance with the requirements in the contract documents or owner requirements. In case of a conflict with owner requirements, the owner requirements shall take precedence.

**METHOD OF MEASUREMENT.** *Design Build – Utility Related Work* as defined in the contract documents will be measured for payment on a fixed price lump sum basis for each utility. The individual utilities will be identified in the contract documents.

**BASIS OF PAYMENT.** The fixed price lump sum for Design Build – Utility Related Work shall include the cost of furnishing all labor, materials, equipment, design, construction inspection, testing, and supervision to satisfactorily complete the work. Progress payments will be made for each utility work in accordance with the contract documents.

### **FIXED PRICE ITEM**

The fixed price shown in the proposal for this pay item is not to be altered in any manner by the Proposer. Should the amount be altered, the new figure will be disregarded and the original price will be used to determine the total amount bid for the Contract.

Note: NN in pay item number denotes serialization by each utility.